THE IRON AGE -- August 4, 1932

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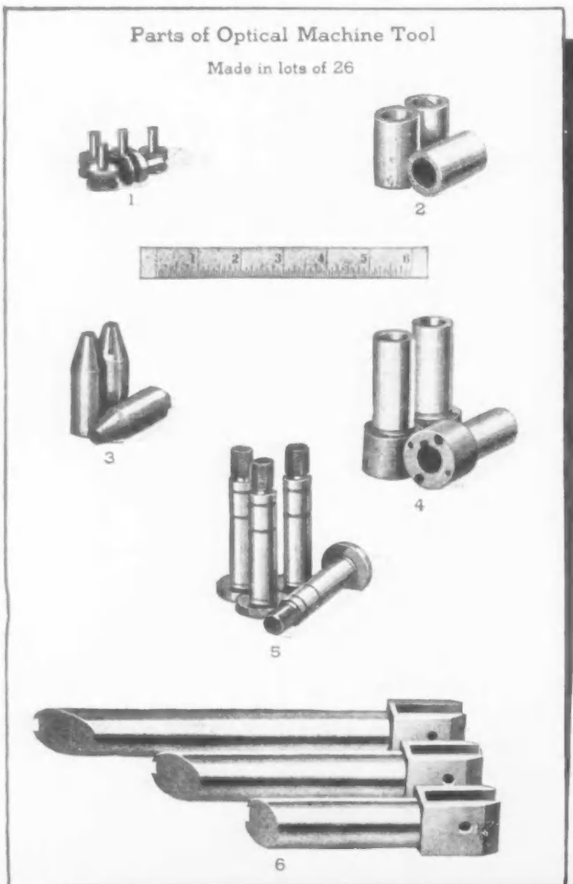
Tool Room Work on a Production Basis



NUMBER OF PART	1	2	3	4	5	6
NAME	SHIFTER ROD PIN	SHAFT BUSHING	BEARING CENTER	SHAFT BUSHING	"T" BOLTS	TOOL BARS
MATERIAL	C.R.STEEL	CAST IRON	TOOL STEEL	CAST IRON	C.R.STEEL	C.R.STEEL
OLD TIME	9.8 minutes	14.5 minutes	14.6 minutes	27.6 minutes	27.5 minutes	30.6 minutes
NEW TIME	8 minutes	11.2 minutes	10.3 minutes	11.5 minutes	18.3 minutes	11 minutes
TIME SAVED	1.8 minutes	3.3 minutes	4.3 minutes	16.1 minutes	9.2 minutes	19.6 minutes

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Bausch & Lomb Optical Company
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..THE IRON AGE..

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Strike Hard When the Enemy Weakens

By JOHN H. VAN DEVENTER
Editor, The Iron Age

DURING the past two weeks there has been a marked change in the sentiment of American business and industry. Fear and Despair have been unhorsed and Hope is once more in the saddle.

This time, Hope does not ride unattended. He is accompanied by a strong body of Evidence and a still stronger body of Conviction—Evidence that the powerful though unseen influences of economic reconstruction are at last bearing fruit in renewed employment; Conviction, even in those industries which are still at their low points, that a definite and continued upturn is forthcoming.

Since the economic cataclysm of 1929, American business has twice previously seized hold of hope only to lose it again. Is the present renewal of confidence more justified than that of eighteen months ago? Have the shifting economic foundations of American business settled sufficiently, since that time, to permit the beginning of rebuilding?

Consider what has happened in the interim.

The American dollar has successfully withstood an unprecedented onslaught of foreign gold withdrawals and threatened debt repudiations. The basis of our national credit and the cornerstone of business, it stands unshaken by the now spent hurricane that toppled the monetary standards of other nations. You hear no more of our possible abandonment of the gold standard.

Having passed through the fire of foreign attacks, the American dollar is being put to constructive work at home. National credit to the sum of more than six billions has been mobilized for domestic service. It has already successfully coped with a threatened bank crisis and is now giving needed support to jaded commodity and investment markets.

American business and industry have cheerfully bent their burdened backs to the task of balancing the budget. Widespread demand for economy in government is already bearing fruit in the form of Federal and municipal budget reductions. And the increasing pressure to this end will unquestionably lighten our taxation overhead in the years to come.

Industry and business have set their houses in order, and have attained a new level of efficiency from which profits will be earned on volumes which formerly would represent losses. Agriculture has gained many millions in purchasing power during the past thirty days. Attempts at harmful pork barrel legislation have been defeated, the bonus army has met a delayed though effective Waterloo, bond prices are strengthening, and even the stock market has, for the time being at least, glimpsed the silver lining.

Hope and conviction are necessary precedents of recovery. But neither hope, nor conviction, nor Government subsidies can pull us around the figurative corner unless backed up by positive action on the part of private enterprise and private capital. The spirit of passive resignation, which has caused banks and business men to concentrate their attention on conserving diminishing assets, must give way to renewed alertness to opportunities for investment and profit. Private dollars must reinforce Government dollars in this crucial stage of the war with hard times.

And no battle was ever won by half-hearted troops. The time to strike the hardest blow is when the enemy shows the first signs of weakening.

Plastic Molding of Phenolic Resins

By ROGERS A. FISKE
Western Editor, The Iron Age

A MULTIPLE mold being made for an automotive part. Vertical millers do speedy and accurate work.

PLASTIC molding offers a challenge and an opportunity to the metal-working industry.

The development of plastics has been proceeding with rapid strides. Thus far, the effect of plastic products has been felt most in the "consumer" field, from the standpoint of competition with steel or non-ferrous materials.

This competition, however, may prove a beneficial one, since the consumption stimulus of attractive plastic molded parts may increase instead of diminish the call for older types of material, which frequently constitute a major portion of the unit design.

PLASTIC molding, an art developed by the earliest pottery makers, has in recent years been taking an increasingly important place in industry through the introduction of synthetic resins. In physical appearance commercial phenolic resin resembles natural resin but when polymerized by heat it becomes radically different from natural resin. By 1920 the urea base materials were made available and the industry was in full swing.

From the viewpoint of iron, steel and machinery, this product is interesting because the molding process while not excessively elaborate is nevertheless exacting and equipment used must be of a high order.

In general the molding technique for the wide range of these synthetic materials is the same. They are furnished in powder form, dry and granular and in a wide variety of colors. They readily soften and flux under the influence of heat and pressure and they can be forced into every corner and crevice in the mold. Essential requirements are steam, electricity or gas for heating purposes and power for presses. At the plant of the Chicago Molded Products Corpn., a single department houses steam boilers, a set of direct-acting, steam-driven pumps which furnish power for hydraulic presses, and compressors which provide air for blowing the dies after each molded part is removed. Presses are operated on high and low pressure with a dual system of 450 lb. to 3000 lb. per sq. in. Steam pressure is maintained at 170 lb. per sq. in., thereby providing a temperature of 370 deg. Fahr.

Die Workmanship Determines Product Quality

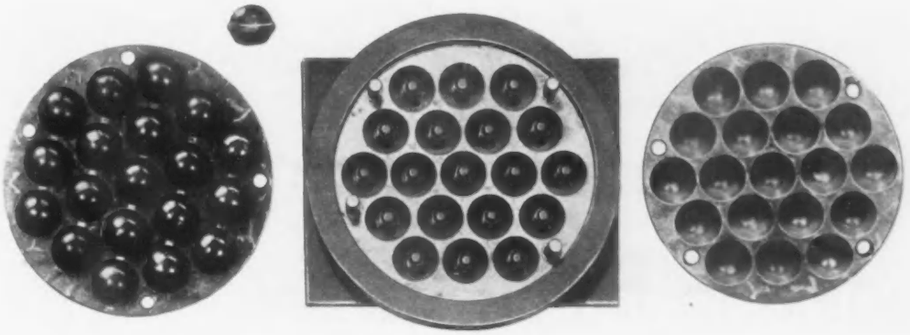
Quality of workmanship put into the die determines in great measure the quality of molded product. Therefore, die making for this purpose is essentially a job for the molder who must in the last analysis stand back of the final product. At this Chicago plant is a tool shop thoroughly equipped with machine tools, bench equipment and auxiliary equipment. Most dies are given a high polish, usually by means of oil and emery and when exceptional finish is required on the molded product the die is chromium plated.

Because plastic molding must be done under heat it is necessary to use hardened tool steel for the dies. Once a mold is made and hardened it is impossible to make any major changes in it without annealing which with the following rehardening process may cause distortion and so destroy the mold. Therefore design must be carefully checked. Single cavity molds are usually made only when some experimentation is needed with the finished piece before exact design and shape can be decided.

Do's and Don'ts in Design

Although there are exceptions to all "don'ts" still there are some general rules that are worthy of attention when designing molded parts. Reentrant curves or undercuts are usually to be avoided and fillets should be used in preference to sharp inside corners. Thin walls, thin ribs, long inside holes with no provision for support and long inserts or wires are usually to be avoided. Inserts are preferable to small tapped holes and holes should not be placed near an edge or face. Lugs or projecting inserts should not be near edges or corners and inserts should not be covered by a thin layer of Bakelite. Oblique holes and cross knurling are among the don'ts. Hexagonal or irregular shaped inserts should not project from the molded part. In general tolerances are ± 0.002 in. on small diameters and ± 0.005 in. on large diameters.

Inserts, usually of non-ferrous metals, are held on pins or inserted in recesses in the mold. Round in-



MOLDS for making gear shift lever knobs. Metal inserts are imbedded in the Bakelite.

serts are knurled and other shapes must be marred along the edge that is to be held by the plastic material.

Waste Not Reclaimable

One problem of this industry is to produce without waste of resin for the reason that any excess material after having been heated and put under pressure is useless and must find its way for slow firing under the boiler. When quantities of pieces to be made are sufficently large, resin is not used in the powder form but is briquetted. The exact amount needed for a mold is carefully weighed and a briquette mold is made that will hold this amount of powder. The shape of the mold varies according to the shape of the piece to be made. The mold is mounted in a press which is fitted with an overhead powder container from which the powder flows to the mold plate. Between strokes of the press a striker arm brushes across the plate filling the mold depression and leveling the powder to the surface of the plate. Heat is not used in this process. Briquettes or biscuits are automatically ejected from the press.

Hand molding presses are used only in connection with molds that are light enough to be handled manually. They are installed in pairs, one press having steam-heated platens for molding and the other press being used to hold the mold for chilling before the piece is ejected. It is needless to add that this is a comparatively slow process and is superseded by automatic or semi-automatic presses when high production is desired. In the hand molding press heat is transmitted to the mold by its contact with the gas, electric or steam-heated platens of the press. Perfect contact must be had or the mold will be heated unevenly.

Heated with Steam and Cooled with Water

Molds used in semi-automatic presses are channeled with both steam and water lines and are successively heated and chilled evenly and without re-

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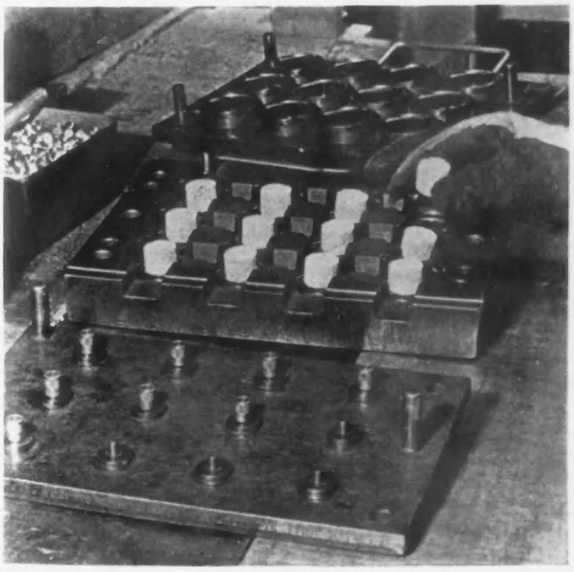
A FOUR unit mold (at right) for producing deep cylinders threaded at the top. The thread ring is screwed off the cylinder after it is stripped from the mold.

THE mold plate (below) in the foreground shows a number of knurled inserts in place on pins. Briquettes are being placed on the middle plate. The third plate is ready to be stripped of the finished product.



Hydraulic Grinders Employed in Making Buick Gears

PERHAPS the outstanding feature of 1932 Buick automobiles is the so-called "wizard control" or automatic clutch control, combined with synchro-mesh transmission. Even with this improvement, plus many others, Buick has been able to reduce its prices to the lowest point in its history. This has been made possible, in part, by low production costs attained in the gear manufacturing department at Flint, Mich., where the installation of a battery of 32 hydraulic gear grinding machines has saved much time and labor, besides achieving a high degree of accuracy. Likewise economies have resulted from a change in the method of assembling the transmission. Contributing considerably to the lessened expense is an overhead monorail conveyor system for carrying gears through the gear grinding department and thence, together with other sub-assemblies, to the main transmission assembly line.

Gears enter the gear grinding department from a carburizing furnace. The carburizing process results in some distortion. They are first put over a dial indicator and rolled to find the lowest point of distortion, this point being used to locate the work in the gear grinding machine. This plan enables the operator to divide up the oversize stock on the gear teeth equally for the grinding wheel so that there will not be an unusual strain on one side of the tooth.

Two Roughing Cuts Followed by Finishing

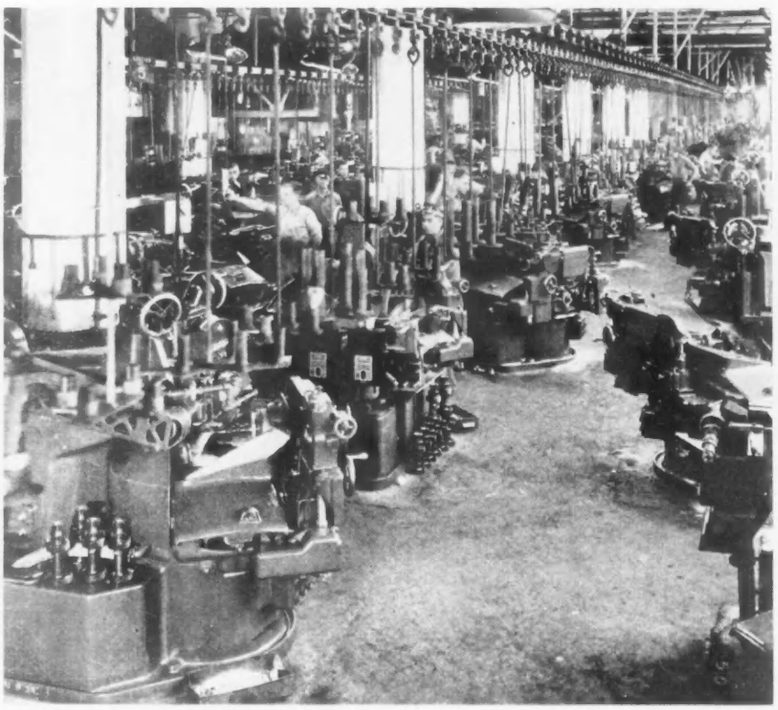
The next operation is to take a rough cut of 0.006 in. on the sides of the teeth in a hydraulic gear grinder. This is followed by a second roughing cut which removes 0.003 in. from either side of the tooth. Then the grinding wheel is redressed for the finish cut, the speed and feed of the machine being slowed down so that the wheel is under the least possible strain and the gear teeth will get the smoothest possible finish.

The gear grinders are operated on a comparatively simple principle. A reciprocating horizontal ram, somewhat similar to that of a horizontal shaper, carries the grinding wheel back and forth through the gear teeth, cutting the adjacent sides of two teeth simultaneously. The wheel is trued with straight sides and top, corresponding to the shape of a tooth in a master rack. The stack of gears being ground is rolled past the reciprocating wheel under the guidance of a master gear and rack so that the wheel always engages the work tooth for tooth as the master rack engages the master gear. The wheel makes as many passes per tooth as are necessary for the finish desired. The work is indexed automatically when it rolls to one side out of engagement with the grinding wheel. When all teeth are finished, the machine stops automatically. A water pump supplies an abundant stream of coolant, in this case an ordinary soda solution, to the wheel and the work.

Gear Blanks Mounted on Grinding Arbors

Gear blanks to be ground are mounted on regular grinding arbors and a driving dog. The spindle is mounted in a large double-row ball bearing made especially for the machine and preloaded to 500 lb. The footstock spindle, which is moved by a horizontal lever, holds the arbor tight on the centers by spring pressure. The footstock itself is adjustable on scraped ways to accommodate arbors or work up to 14 in. long.

The ram is operated by a 2¾-in. piston hydraulic motor which produces ram speeds up to 60 ft. per min. Oil reaches the ram motor through a reversing and speed control valve on the right side of the bed and exhausts through the same valve back to the tank. The ram speed is controlled as desired by a relief valve. The ram assembly weighs about 925 lb. and is held in position by its own weight. One V and one flat bearing are used, the design being self-adjusting for temperature and wear. The ram is



To simplify control of production, the 32-gear grinders are arranged into four sections consisting of two rows of four machines each. The entire battery is manned by sixteen operators.

reversed without perceptible shock, even at full speed. The ram stroke is adjustable for length and position by two dogs which operate the reversing valve. The maximum stroke is 6⅞ in. Ram bearings are lubricated by pressure.

The wheel is dressed so that its periphery in shape and size is that of the straight-sided basic rack of the involute system. Dressing is done by three diamonds, one in each of three sliding bars operated by a single lever. The two bars for dressing the sides of the wheels are independently adjustable by a vernier to angles from 13 to 30 deg., by minutes.

Table Also Hydraulically Operated

The table is driven horizontally by a 3-in. piston hydraulic motor and is reversed automatically. It has two speed ranges, a slow one for the grinding, and a rapid one for indexing. The speed is changed automatically from one range to the other by means of dogs which operate a valve to control the hydraulic motor. The slow speed is varied for rough or finish grinding by moving a lever. When the work is completed, the table is moved under power to the extreme right for ease in unloading.

Master gears and the racks used with them are made of hardened, ground steel, one three-piece master rack being required for each diametral pitch to be ground. The master gear is a duplicate of the gear to be ground in number of teeth and face diametral pitch; however, it does not need to be the same in pressure angle. Immediately above the master rack is a slide on which are mounted two indexing racks. The indexing rack slide moves between adjustable stops and

▲ ▲ ▲

BUICK has lowered gear production costs by installing a battery of 32 hydraulic gear grinders, each of which turns out 12 complete transmissions every 24 hours. A gear tooth passes through two rough grinding and one finish grinding operation in 45 sec. of actual cutting time. Through rearrangement of sub-assembly work, 24 men now assemble 450 transmissions in a 9-hr. day.

▼ ▼ ▼

is moved the distance between two rack teeth at each end of the table stroke. It is operated by a hydraulic piston motor which is controlled automatically by a valve. The motion of this slide indexes the master gear and the work, as its motion rotates the master gear one tooth. Indexing takes place at either end of the table movement while the master gear is out of mesh with the master rack and in mesh with either indexing rack, the work at the same time having rolled to one side out of contact with the wheel.

Two motors supply the power for the machine. One 2-hp., 1800-r.p.m. motor is carried in a housing on the ram, driving the wheel spindle through a belt which is tightened by a spring idler pulley. Spindle speeds of 2215 and 2500 r.p.m. are provided, giving surface speeds up to 7000 ft. per min. A 5-hp., 1200-r.p.m. motor, mounted under the cover on the side of the bed, is directly connected to two geared oil pumps, supplying the power for the entire hydraulic system and for the coolant. A separate motor and centrifugal pump supply the coolant to the work.

Each hydraulic grinder at Buick turns out 12 transmissions per 24 hr. This means that one tooth passes through two rough grinding and one finish grinding operation in 45 sec. of actual cutting time.

When the operator takes the gear from the machine, he hangs it on an overhead conveyor which takes it to the inspector nearby who checks the accuracy of the pitch diameter of the teeth and inspects the finish on the face of the gear. After being marked for future reference, the gear passes to another inspector who rolls it on a dial indicator to determine eccentricity and to discover high or low teeth.

Tooth Face of Gears Lapped

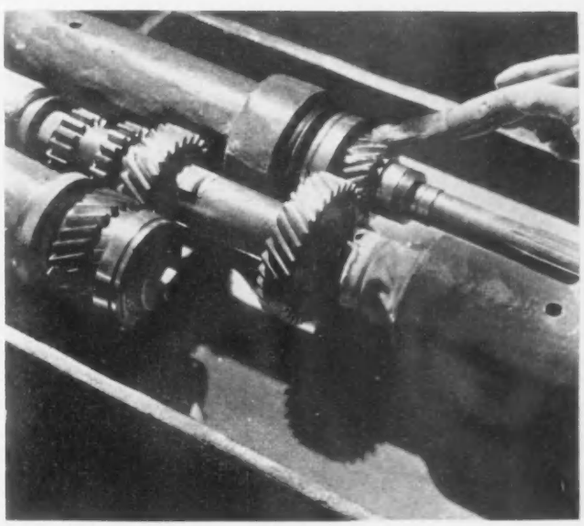
Gears then are matched, set and put on a lapping machine where a smooth finish is lapped on the face of the gear teeth. After this last machining operation, emery and oil are removed from the gears by means of a naphtha bath, followed by a seal oil bath and a hot water rinse. Gears then are hung on an overhead conveyor and taken to the transmission assembly line. Before being assembled in the transmission, they are tested in the transmission case to make sure that noise has been eliminated. Each gear is checked for tooth spacing.

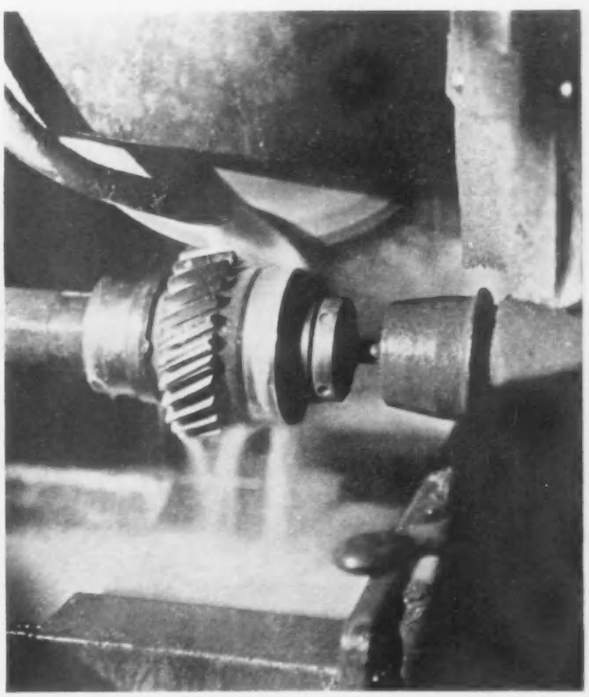
To avoid confusion at any future date in tracing a gear back to the work done on it in the gear grinding

(*Concluded on Advertising Page* 18)

A RECIPROCATING horizontal ram (at right) carries the grinding wheel back and forth through the gear teeth, generating the adjacent sides of two teeth simultaneously.

A SMOOTH finish (below) is lapped on the face of the gear teeth on a special lapping machine.





Wisconsin Plans To Establish Unemployment Reserves

WHAT the State of Wisconsin has adopted to establish unemployment reserves, what proponents and opponents think of the measure, what voluntary plans outside the law have been evolved by individual and group employers, —these are told in an article of prime, timely interest, particularly with other States actively considering compulsory unemployment insurance legislation.

IN January, 1932, Wisconsin adopted a State system of compulsory unemployment reserves with the provision for exemption if employers having a total of more than 175,000 workers either guarantee steady employment or adopt satisfactory systems prior to June 1, 1933. If the employers arrange for the exemption the compulsory plan will not go into effect. In the meantime six States, Connecticut, New York, Ohio, Pennsylvania, New Jersey and Massachusetts, are considering adoption of laws similar to the Wisconsin act.

Compulsory System of Wisconsin

BRIEFLY stated, the Wisconsin act establishes a compulsory system of unemployment reserves but an employer may be exempted by the State by either guaranteeing annually 42 weeks of 36 hr. each to each eligible employee or by installing a satisfactory voluntary system of unemployment benefits. The act goes into effect July 1, 1933, unless before June 1, 1933, employers having an aggregate payroll of 175,000 workers take advantage of the exemption clause, that is adopt a voluntary system.

After the act goes into effect, voluntary plans either for unemployment benefits or for guaranteed work may be adopted after that date, and those adopting such plans will be exempted from the compulsory plan.

Farm labor, domestic help, relief projects, public officers, school teaching, salaried public jobs, railroad and logging work and part-time work; and employers of less than 10 are not included in the act. Not eligible to benefits are those who have not worked in the State for 40 weeks, those who receive over $1,500 a year or those who have not lived in the State for two years.

The law provides that each employer must pay to the State treasurer 2 per cent of his payroll (not including those paid $300 a month or more and those guaranteed $1,500 a year in advance). Administration cost is an extra 0.2 per cent.

An unemployed man must wait two weeks after which he will draw, with a limit of 10 weeks in a calendar year, $10 a week from the appropriate employer account in the State treasury. But only so long as he does not refuse to accept suitable employment. An employer's account is not liable six months after the man has left him nor if the man had worked for him for two weeks or more. Payments are to be taken from the account of the last previous employers in the ratio of one week's benefit to four weeks' employment.

Benefits are barred by voluntary quitting without cause, illness, trade dispute or act of God. As the reserve per employee grows contributions are lowered from 2 per cent, and benefits are scaled down if the reserve per employee drops.

Local employment offices and district appeal boards are established under the Industrial Commission which must approve all voluntary plans.

Objections That Are Voiced

A PLAN of this kind cannot be advanced without objections being raised. The fear of future liability has its effect on the minds of employers and they will seriously count the cost of taking on additional men and therefore some hold to the opinion that the law will actually hinder the spread of employment and thereby prolong periods of depression.

Still others point to this law as an entering wedge and fear that provisions of the law will be stiffened as time goes on. Another objection is that an unemployed man need not accept new work unless it is suitable and "suitable employment" as defined in the law is difficult to interpret because of exceptions and limitations. Therefore it is claimed that an unemployed man may refuse work offered as long as he desires to live on the "dole." Also, a man may quit his job and lay claim against his former employer under the guise of having left because of his employer.

Backers of this movement are inclined to see resemblance between this system and workmen's compensation. Their opponents, however, claim there are wide differences, such as that it is reasonable to charge an employer with accidents in his plant because they are actually his responsibility but unemployment results from nation-wide or even world-wide conditions, which the employer cannot control. It is also pointed out that a workman will not voluntarily injure himself but many of them will not be adverse to becoming voluntarily unemployed and loaf whenever possible.

The point of analogy between reserves for dividends and reserves for unemployment insurance is not well taken in all quarters for the reason that reserves from dividends represent earnings withheld from stockholders whereas according to the Wisconsin law nothing is withheld from workers' salaries in boom times to be passed to them in times of depression.

Contentions of Proponents of the Act

THE majority report denies that unemployment is an emergency condition due entirely to the present depression. It contends that lack of systematic plan at present tends to demoralize the worker and that relief as now practiced comes from taxes on property and therefore falls on the

small home-owner and the farmer. Irregularity of employment is called a social waste.

The report quotes figures from the Department of Commerce to show for the country as a whole that those whose incomes are in the form of interest or dividends have gained steadily through the depression period whereas income of factory workers in Wisconsin in the same period has been more than halved. The stand is taken that the reserve should be recognized as a part of the cost of production and the suggestion is made that possibly compensation for unemployment will pay for itself through lower labor cost per unit of production without reduction in wage or price rates.

That the law will be a heavy burden rather than a help to industry is contended in the minority report, which finds that the Wisconsin tax commission reports 3399 out of 6116 manufacturing and mercantile corporations lost money in 1930. There were 929 fewer factories in Wisconsin in 1929 than in 1919, and from 1928 to 1930 the decrease was over 500. The point is therefore raised that industry needs more cooperation from the State government rather than more restrictions. The results would be greater stability for the industries with resulting insurance of stable employment.

J. I. Case Co. Has Own Plan

THE J. I. Case Co., Racine, Wis., has voluntarily adopted what is known as the Case employment insurance and savings plan. It applies to the Racine factory employees whether on hourly or piece rate basis and it becomes effective after six months of continuous and satisfactory service. An employee placed on the monthly payroll no longer receives company contributions but may if he desires continue personal addition to his reserve.

The company contributes 5 per cent and the employee sets aside a like amount or 5 per cent of his earnings until a reserve equal to 6 months average full time earnings has been accumulated. After that the percentage drops to 2 per cent until one year's average full time earnings have been accumulated.

No addition will be made to an employee's reserve on a semi-monthly payroll date unless he has had 70 hr. or more of work in the period. All funds contributed are deposited with a trustee, which must be a trust company or a bank with trust powers. Each employee has an undivided interest equal to the amount accumulated for him. The company's obligation ends with its contribution and assistance in building individual reserves under the plan.

The trust agreement is revocable and under it the trust company may invest the reserve funds in securities permissible to life insurance companies organized under Wisconsin law. Net income derived from investment of the fund is prorated among the beneficiary interests.

Withdrawals may be made only during periods of business depression when the company cannot furnish sufficient employment and the employee cannot secure work elsewhere. In case of inability to agree between employee and a representative of the company, as to conditions justifying withdrawal, the decision is left to the Circuit Judge for Racine County, or in his absence, or inability to act, to the Municipal Judge of the City of Racine, whose decision is final.

Withdrawals can be made upon application in writing to the company; when drafts upon reserve are actually necessary; after 90 days of unemployment; as required by the employee but not exceeding 40 per cent of the average semi-monthly earnings during the preceding twelve months; at the regular semi-monthly payroll dates; when an employee is working part time and earning less than 40 per cent of his average and then only the difference between his earnings and the 40 per cent actually required. The amount withdrawn for any semi-monthly period shall not exceed $40 and withdrawals shall cease when the reserve for the individual employee's credit is exhausted. Limitations are put on withdrawals when the employee is receiving benefits from the Case Employee's Benefit Association or under the Workmen's Compensation Law.

In the case of permanent disability withdrawals may be made during the period of disability in semi-monthly payments up to 40 per cent of average earnings, less any disability benefits received, until the individual's reserve is exhausted. An employee on pension may withdraw semi-monthly from his reserve to a maximum of 40 per cent of his average earnings until his reserve is exhausted. An employee who has retired on account of age may withdraw semi-monthly to a maximum of 40 per cent of average earnings until his reserve is exhausted.

Total amount in a deceased employee's reserve will be paid to his widow, or if no widow is surviving to his dependent minor children, if any, in semi-monthly installments not exceeding 40 per cent of average earnings. If beneficiary other than the widow or dependent minor children is designated, that portion of employee's reserve set aside by him, plus net earnings, shall be paid to the designated beneficiary or the employee's lawful heirs, and that portion contributed by the company, plus net earnings thereon, shall be repaid to the company.

The employee has the privilege of changing the beneficiary's name. The employee's reserve is not subject to assignment by him nor is it subject to the claims of his creditors. In the event of any attempted assignment, or by assignment by operation of law, that portion of the reserve contributed by the company, plus net earnings thereon, shall be repaid to the company.

The plan specifically states that it in no manner restricts either the employee or the company to terminate the employee's service with the company, at which time all further contributions and deposits under the plan stop. If the employee, whose service to the company has terminated, remains in the State of Wisconsin, the amount of reserve to his credit will continue to his credit until another period of business depression or general unemployment when the reserve may be withdrawn in semi-monthly installments not exceeding 40 per cent of employee's average earnings, until the reserve is exhausted. If an employee who is no longer serving the company permanently gives up residence in the State of Wisconsin, he may on 30 days' notice, withdraw the portion of his reserve set aside by him and all contributions made by the company for his account, plus earnings, shall be returned to the company.

If an employee is discharged for insubordination, willful damage to the company's property, or for dishonesty, all contributions made by the company shall be returned to the company. That part of the employee's reserve set aside by him, plus net earnings, shall be subject to withdrawal upon application in writing to the company, or when drafts upon reserve are actually necessary.

Plan of Fond du Lac Employers

THE Demountable Typewriter Co., Sanitary Refrigerator Co. and the Northern Casket Co., Fond du Lac, Wis., instituted a voluntary unemployment relief plan in August, 1930, and amended it in September, 1930. This plan provides that all factory and office employees, except managers, superintendents and salesmen, between the ages of 21 and 60, who have been employed for a period of one or more years by one of the parties in the agreement will automatically come under the plan. Employees under this plan will be entitled to receive steady employment by any one or more of the employing companies or receive worth-while employment with some other employer, or when employment cannot be provided, to participate in cash unemployment benefits, for the period of unemployment but not exceeding 100 working days in the aggregate, to be paid, from an "Unemployment

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Eliminating Cold-Working Strains in Drawing Rustless Steels

By C. C. SNYDER
Alloy Steel Division
Republic Steel Corpn.

DEEP drawing of certain rustless steels has been attended by problems not easy to solve. The author points out the great degree of hardness developed in these steels by cold working. He compares the properties of an 18-8, an 18 per cent chrome and a plain carbon steel before and after cold working. Certain measures are indicated which he regards essential for relieving strains due to cold working and thus preventing cracking. Properly annealed, the 18-8 type will permit of considerable drawing before it reaches the stage of rupture. Reductions approximating 40 per cent may be safely made under certain conditions.

THE 18-8 group of alloys, because they are of an austenitic, non-magnetic nature, will harden considerably upon being deep drawn, spun cold-drawn or severely deformed in some other manner. This, of course, is not news to the sheet metal worker, nor to the metallurgist who allows himself to be concerned with new alloy developments. This article will attempt to point out, however, the great degree of hardness obtained by cold working, to make comparisons of the cold working properties of 18-8 with those of 18 per cent chromium and 0.30 per cent carbon steel, and, last, but not least, to indicate the necessity of relieving cold working strains to avert the possibility of cracking.

The work-hardening characteristics of 18-8 are not typical alone of this analysis, as nearly all metals will harden to various degrees when subjected to stresses which exert them beyond their elastic limit. It is true, however, that the 18-8 alloy will harden to a greater degree with a given amount of cold work than common steel, 18 per cent chromium iron, or the non-ferrous metals.

This fact is illustrated by the figures shown in Table I comparing 18-8 with 18 per cent chrome iron and 0.30 per cent carbon steel. These data were obtained by cold-drawing bars and measuring their physical properties before and after cold drawing. Table II reveals the great degree of hardness attained when an 18-8 round is reduced in diameter from 0.218 to 0.062 in. by successive drafts.

Reference to Tables I and II gives a good picture of the work-hardening properties of 18-8, and reference to the photomicrographs will show the structural changes that take place. Photomicrograph Fig. 1 discloses the completely equi-axed uniform austenitic structure of fully heat-treated 18-8 metal. The structure represents the condition present in the 5/16-in. round (Table I) before cold drawing. Fig. 2 is the distorted and somewhat magnetic structure of the same piece after being cold drawn to ¼ in. Fig. 3 represents the highly cold-worked martensitic and magnetic structure of the sample after having been cold drawn from 0.218 in. to 0.062 in. (Table II).

Translating this language to 18-8 sheet or strip which has been deep drawn, we have the metal going through the same cycle of changes from the soft, heat-treated, austenitic structure to the harder and somewhat brittle structure after deep drawing.

The foregoing data have been included merely to show the characteristics of these metals and to enable a better understanding of the necessity of heat treating for relief of strains following cold deformation.

Properly annealed, 18-8 will permit of considerable drawing before it

Fig. 4—Cracks occurred several days after this vessel had been drawn from 18-8 alloy steel.

Fig. 5—Some drawings made from 0.050-in. gage 18-8 metal. Cracks were caused by excessive cold working. These were eliminated by an adjustment of dies on the first operation, followed by annealing at 2000 deg. F. The next steps in drawing were then performed successfully with no further annealing.

Fig. 1—Properly heat-treated 18-8 steel. Uniform grain size and non-magnetic. Brinell No. 135. 500 diameters.

Fig. 2—Cold-worked structure of 18-8. Slightly magnetic. Brinell No. 293. 500 diameters.

Fig. 3—Severely cold-worked structure of sample cold-drawn from 0.218 in. to 0.062 in. (Table II.)

reaches the point where rupturing will occur. It has been found from actual experience that reductions approximating 40 per cent may be successfully made, provided contributing factors, such as sufficiently large radii, are allowed and proper die steels and lubricants used. This is dependent also on the gage of the metal, it being possible, of course, to draw heavier gages deeper than the light gages.

By 40 per cent reduction, it is meant that the depth of draw is 40 per cent of the blank size—in other words, by using a 10-in. diameter blank, a 4-in. cup may successfully be drawn. Draws even greater than 40 per cent have been made with specially heat-treated 18.8. There is considerable risk in such cases, however, of the drawn article rupturing following such severe deformation. The rupture may not occur for an hour afterward, and instances have been reported where the cracking did not occur for several days following the drawing.

The best plan of procedure to follow when exceptionally heavy draws are required is to insert an intermediate heat treatment, or to heat treat immediately following completion of the drawing. The subsequent heat treatment will relieve the severe strains set up in drawing and restore the original austenitic condition. The heat-treating temperature should be high enough to insure the complete solubility of the carbides, and cooling should be rapid enough to prevent the formation of carbides. Temperatures of approximately 2000 deg. F. should be used for intermediate annealing and 1850 to 1900 deg. F. for relief of strains.

Heat treatment should follow very quickly after the drawing has been completed, not allowing more than 10 to 30 min. to elapse before the article is placed in the furnace. The stored up strains in the metal seem to intensify with the passing of time, and no delay should occur in removing these strains. This is particularly true in cold weather when a strained condition is apparently more sensitive and more likely to lead to cracking than in warm weather. Another factor which accentuates this condtion is the presence of wrinkles or scores in the drawn article.

Sensitivity to cold weather conditions has been noticed in the case of a number of metals, and gives the steel producers more or less worry every year. Large bars of alloy and carbon steel, used for forging purposes, will crack upon being sheared, or following shearing, during the cold season, while during the rest of the year no trouble will be encountered. Tool and die steels, after being quenched from the hardening temperature, are always quickly reheated to the tempering heat to prevent cracking, which otherwise would be caused by the stored up strains produced from the structural changes taking place in the metal during heating and cooling.

In summarizing, the necessity should be pointed out again of annealing 18-8 when it is severely cold worked to eliminate cold working strains and breakage. For shallow-drawn parts, the annealing treatment need not be resorted to. All metals harden to a certain extent when cold worked, but 18-8, because it is an austenitic type, exhibits this tendency to a marked degree.

TABLE I.—Comparison of Three Materials Before and After Cold Drawing

	18-8	18 Per Cent Chrome Iron	0.30 Per Cent Carbon Steel
Original bar size	5/16 in. rd.	5/16 in. rd.	5/16 in. rd.
Cold drawn to	¼ in. rd.	¼ in. rd.	¼ in. rd.
Original yield point	49,500 lb.	49,500 lb.	60,500 lb.
Original tensile strength	94,000 lb.	75,800 lb.	75,800 lb.
Original elongation, per cent	56.0	36.0	20.0
Original red. of area, per cent	76.0	71.0	61.0
Original Brinell hardness	135	149	170
Final yield point	79,600 lb.	90,800 lb.	80,500 lb.
Final tensile strength	154,100 lb.	96,800 lb.	90,300 lb.
Final elongation, per cent	9.0	13.5	12.0
Final red. of area, per cent	65.1	66.5	45.0
Final Brinell hardness	293	202	196
Increase in tensile strength, per cent	63.9	23.0	19.0
Increase in Brinell hardness, per cent	117.0	35.0	15.3

TABLE II.—Effect of Reduction on 18-8 Round

	Dia., Inches	Reduction in Area, Each Pass, Per Cent	Yield Point, Lb. per Sq. In.	Tensile Strength, Lb. per Sq. In.	Elong. in 2 In., Per Cent	Brinell Converted
Annealed	0.218	...	34,850	88,400	65.0	140
Cold drawn to	0.188	25.7	101,000	139,000	22.0	285
Cold drawn to	0.160	46.2	129,300	186,000	5.0	341
Cold drawn to	0.126	66.6	139,000	213,500	3.5	388
Cold drawn to	0.110	74.5	157,900	231,600	2.5	401
Cold drawn to	0.094	81.5	.....	244,600	2.0	415
Cold drawn to	0.085	85.0	.....	267,900	2.0	429
Cold drawn to	0.072	89.3	.....	300,000	2.0	429
Cold drawn to	0.062	92.0	.....	333,500	2.0	401

Sponge Iron Made by Smith Process from Brazilian Ore

EARLY in 1931 a steel company was formed in Rio de Janeiro, Brazil, with the name Syndicato Nacional de Industria Commerciom S.A. On its board of directors is a group of leading Brazilian industrialists, among them Fortunato Bulcao, president of the company; J. B. Monteiro Lobato, Eugene Lefevre, Jr., Afranio do Amaral and A. A. Barros Penteado.

The company was formed to experiment with the W. H. Smith (Detroit) process of direct reduction as applied to some of Brazil's abundant iron ore deposits, which, because of a lack of coal, cannot be smelted in the ordinary blast furnace. The Smith process was described in THE IRON AGE, April 25, 1929. In an experimental plant in Rio de Janeiro successful results are reported to have been obtained by using such carbonaceous fuels as charcoal, sawdust, leather waste and low-grade coffee beans. To commemorate the results a medal has been made from the product of the experiments, a photograph of which is reproduced.

The sponge iron, after magnetic separation and grinding, was placed cold between the dies of an ordinary stamping press. Under a pressure of 200 kg. per sq. cm. the medal became solid. It was then submitted to a temperature of approximately 1000 deg. C., which further solidified it, bringing it to the condition of a cemented steel.

This "new iron," as sponge iron is called in Brazil, has been melted in the electric furnace and some of it is reported to have been converted into wrought iron with physical properties equal to good low-carbon steel. The cost of the iron in briquettes in Brazil is claimed to be lower than the production cost of pig iron in Europe and the United States.

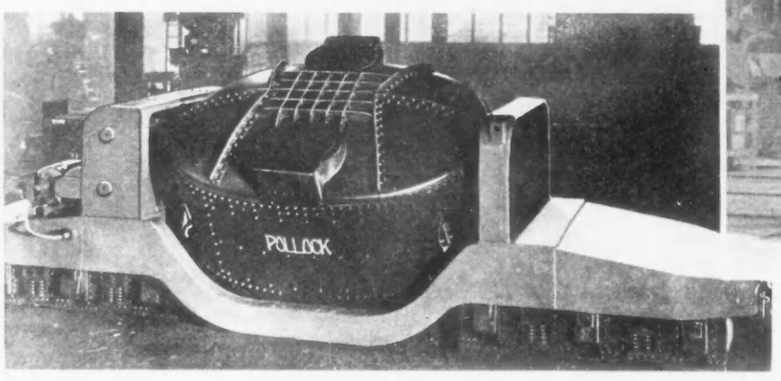
Pollock Company Now Does Welded Rolled Steel Work

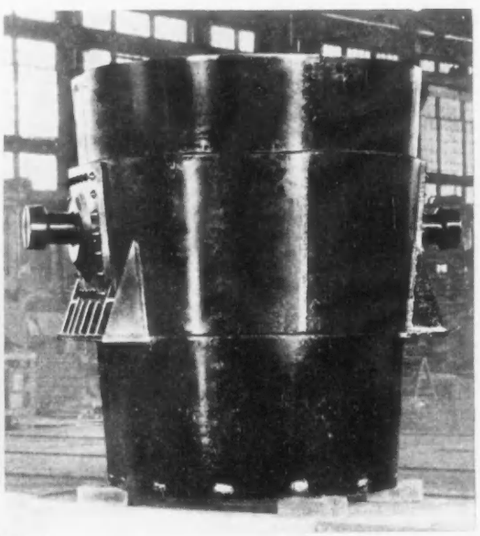
AFTER an experience of 69 years fabricating heavy equipment for steel mills, blast furnaces, refineries, and other basic industries, the William B. Pollock Co., Youngstown, announces the establishment of a special engineering department to design shop equipment for welded rolled steel fabrication.

By redesigning a hot metal car to utilize arc welded rolled steel, the Pollock company achieved a saving in weight of 10,000 lb. The newer type, weighing now about 180,000 lb., is shown in an accompanying illustration. The saving in dead weight was secured even with the addition of a tipping mechanism, and the capacity of the car was increased to 140 tons of hot metal over 115 tons in the older type.

A second picture shows an open-hearth hot-metal ladle of rolled steel arc welded, which was designed by the Pollock engineering department. This ladle for the same capacity—85 tons of hot metal—as the former type, has a reduced weight of 30,000 lb.

Hot-metal car (below) is constructed of arc welded rolled steel, with weight reduced by 10,000 lb. and capacity increased to 140 tons from 115 tons for the older type of car.





Use of rolled steel and arc welding brought the weight of hot-metal ladle down to 30,000 lb., eliminating the handling of 21,000 lb. by the open-hearth crane.

Alloy Cast Iron Developed For Machine Tool Parts

BY EDWIN F. CONE
Associate Editor, The Iron Age

TO meet the severe stresses and strains resulting from some modern machining practices and also to overcome loss from wear, the Bullard Co. has developed a special alloy cast iron, described in this article. Heat-treated and tempered, it has high tensile strength and a hardness up to 340 Brinell. Features are its easy machineability in the high hardness ranges, its resistance to wear, and its rigidity.

IN the construction of machine tools, the selection of materials is of vital importance. This is particularly true of some of the more modern types of machines now being made and used—machines which, in the many cutting operations on metals of which they are capable, border on the magical. In the early days of the industry, the quality of the materials from which such machines were made was not of as much importance as it is today. As their evolutionary development has progressed, greater attention has had to be focused on the type of materials best suited to meet the stresses and strains brought about by modern machining practices.

An outstanding example of these facts is a completely modern machine tool, the Mult-Au-Matic, manufactured by the Bullard Co., Bridgeport, Conn. In these machines, obtainable in six or eight-spindle models, which perform several machining operations respectively at five or seven stations at one time, massive construction with its accompanying absorption of vibration has been deemed essential to best results. This massive and rigid construction permits the use of greater input power, increased speeds and heavier feeds than heretofore required by the average user, but which have become almost essential to production efficiency with the use of the newer cemented carbides and other cutting materials.

Alloy Steels in Many Parts

To keep pace with these developments, there has been a wider and wider use of alloy steels and irons in machine tool construction. In the new Bullard type "D" Mult-Au-Matics, a large number of parts, including clutches, pinions, and gears, are made of an alloy carburizing steel (3.40 to 3.80 per cent nickel and 1.25 to 1.75 per cent chrome). Many parts also are made from an oil-quenching type of chrome-nickel alloy steel. These steels are carefully heat treated to best meet the needs of the various parts.

In certain cases, however, the characteristic function of parts, such as slides, saddles, saddle guides, tool slides, slide gibs, and swivels, do not require the strength of high-grade steels but, on the other hand, must have sufficient strength and wearing qualities to meet the demands of their particular function.

A Nickel-Chromium Cast Iron Developed

A progressive step in metallurgy to meet these conditions is the development by the Bullard Co. of a new alloy cast iron incorporated in the parts listed above. This is not a "hit-or-miss" development, for this iron is being produced commercially and is giving exceptionally satisfactory results where ordinary cast iron has fallen short. It is a nickel-chromium iron and, when needed, may be suitably heat treated to meet conditions and requirements. It is a type of what has come to be known as high-test iron, and yet in its treatment will develop some remarkable physical properties.

In making up a heat, as a basis for the cupola charge, about 94 per cent average steel scrap is used. Then, about 2.50 per cent of 90 per cent ferrosilicon and 2 per cent of 90 per cent ferromanganese are added. This material is coated with cement before being introduced into the charge. Ladle additions consist of 1.50 per cent of "F" nickel shot and 0.50 per cent of ferrochromium. The average composition of the resulting iron is as follows:

	Per Cent
Total carbon	2.75 to 3.00
Silicon	2.40 to 2.70
Manganese	0.70 to 1.00
Nickel	1.50 to 1.75
Chromium	0.30 to 0.50
Sulphur and phosphorus	0.100 max.

There is a marked difference in

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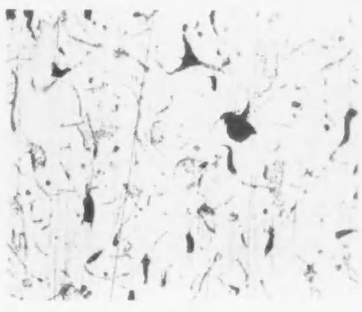


Fig. 1—Nickel-chromium alloy gray iron showing absence of large flakes and even distribution of graphite formation.

Fig. 2—The as-cast structure of the Bullard alloy gray iron. 650 diameters.

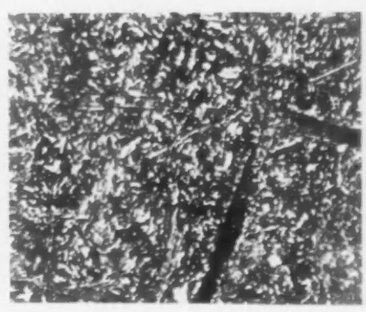


Fig. 3—Structure of the nickel-chromium gray iron in the heat-treated condition. 650 diameters.

Cost of Pipe and Segregation in Steel Ingots

Unnecessary Annual Loss Through Discards in United States of the Order of $120,000,000

By LEWIS B. LINDEMUTH*

WHEN the country is making steel at the rate of 50,000,000 tons per annum, it is losing $120,000,000 uselessly. In other words the yield of ingots in semi-finished forms—billets, blooms and slabs—shows today too much of a discard, with consequent remelting of steel on which work has been expended in the blooming mill. The unnecessary cost is a result of the large shrinkage cavity or pipe formed during solidification, which pipe requires cropping from what has been the top portion of the ingot.

Manufacturing costs alone are not the entire consideration. Any increase in the percentage of yield of products from ingots is equivalent to a corresponding increase in both the ingot and blooming mill capacities. A satisfactory solution to the problem of piping can therefore be looked upon as having a very definite value expressed in terms of plant investment.

The efforts to overcome present conditions are negligible in comparison with the expense of continuing present practice. Furthermore, the percentage of necessary discard, to maintain present standards of soundness, is being increased at a fairly rapid rate by the introduction of methods and specifications intended to improve the quality of the steel.

Amount of Discard Is on the Increase

The volume of the shrinkage cavity is little more than 2 per cent of the volume of the ingot, but its shape and location in the ingot is such that seldom less than 15 per cent and frequently more than 50 per cent of the ingot must be scrapped because of it. Various factors affect the shape of the pipe cavity causing wide variations among different grades of steel, different heats of the same grade, and even ingots of the same heat.

For more than twenty years some ingot producers have controlled the discard to remarkably uniformly low figures by a careful regulation of the extent of deoxidation. This means of control is, however, being rendered useless by the demand for completely deoxidized steel. Specifications calling for higher manganese than heretofore, and a tendency to insert minimum silicon requirements, are the same, in effect, in lengthening the pipe and increasing the necessary discard.

Whether or not the improvement in quality justifies the increased cost has probably not been determined, but so long as this cost is absorbed by the steelmaker, adverse specifications and manipulations, adverse as regards costs, will continue on the increase.

With completely deoxidized steel the pipe cavity is long and narrow, requiring a proportionately large ingot discard. With alloy and special steels where this procedure is principally confined at the present time, it is safe to estimate that the cost of blooms and billets will, on account of it, be increased by $5 to $10 a ton. With rail steel, where manganese contents much higher than heretofore are being called for, the increased cost for additional discard will approximate $2 to $3 a ton of rail blooms.

More frequent than the adoption of furnace practice either for complete deoxidation or high manganese content is the appearance in specifications for many varieties of steel of both maximum and minimum silicon limits. In all of these cases, except the very high silicon steels with special properties, the silicon content specified is negligible in its influence on the physical properties of those particular steels. The use of silicon as a deoxidizer is practically the only means now available for regulating, after a fashion, the required discard. It is not, however, the silicon which appears as content of the finished steel, but the silicon which has been added to the molten metal and oxidized and no longer appears in the analysis.

If, therefore, silicon in definite proportion is required, the steel maker has his only means of controlling discard taken from him. If it is the object of those so specifying silicon in this manner to assure themselves of an excess of deoxidizing influences, it is questionable if the results so obtained would be satisfactory to the purchaser. If the discard cost were passed on to the consumer it undoubtedly would not be. The discard cost is, however, being absorbed by the producer, and minimum silicon limits in specifications are increasing in number.

Average Yield Is 78 Per Cent

The average yield of billets, blooms and slabs is approximately 78 per cent of the ingot weight for all grades combined, except those steels made by the "rimming" method. For some of the less expensive commercial grades where traces of unsoundness are of no great moment, the yield is higher, while for rails, alloy, and forging grades it is generally considerably lower.

The highest yield which could be obtained would be close to 94 per cent. The 6 per cent represents scale loss in the soaking pits and the neces-

(Continued on Advertising Page 16)

Cost of Billets for Various Yields from Ingots

Ingots—	$18.00	$20.00	$22.00	$24.00	$40.00	$60.00	$240.00
Scrap—	8.00	10.00	11.00	12.00	15.00	20.00	60.00
Per Cent Yield							
94	20.96	23.00	25.09	27.18	44.08	65.16	255.05
90	21.58	23.64	25.79	27.90	45.47	67.29	264.09
85	22.49	24.58	26.80	29.03	47.47	70.35	276.45
80	23.56	25.70	28.02	30.34	49.80	73.90	291.70
75	24.81	27.05	29.46	31.90	52.56	78.08	309.02
70	26.33	28.63	31.21	33.79	55.80	82.97	328.91
65	28.13	30.55	33.28	36.01	59.56	88.78	352.53

Blooming mill cost taken as $2 per ton of ingots rolled.
Scale loss 2 per cent.

Example: With 78 per cent yield, $1.00 \div 0.78 = 1.282$ tons of ingots are required to make 1 ton of billets. With the cost of ingots at $18 a ton and the cost of conversion from ingots to billets $2 a ton, the cost of 1 ton of billets appears to be $1.282 \times (\$18 + \$2) = \$25.64$. The $100 - 78 = 22$ per cent of discard is made up of 2 per cent scale and 20 per cent scrap, and the latter at $8 a ton is worth $1.60. Thus the net cost of billets is $\$25.64 - \$1.60 = \$24.04$ a ton.

With 20 per cent yield, 1 ton of billets requires 1.111 tons of ingots, or $22.22 gross cost per ton of billets. The $10 - 2 = 8$ per cent of scrap available at $8 reduces the amount by 64c., so that the net cost is $\$22.22 - \$0.64 = \$21.58$ a ton, as indicated in the table.

If there were a general yield of 90 per cent instead of an average yield of 78 per cent, the saving in semi-finished material costs when ingots cost $18 and scrap is at $8 would therefore be $\$24.04 - \$21.58 = \$2.46$. An annual output of 50,000,000 tons of ingots, or 45,000,000 tons of billets, would show a total saving of $110,700,000, and the higher the unit cost of ingots the higher the saving per ton, so that with ingots say at $24 and scrap at $12, the annual saving would be of the order of $135,000,000, and so on.

*Chrysler Building, New York.

High-Speed Forging Sizing Presses of Compact Design

A LINE of steel high-speed forging sizing presses featuring compactness, as well as rapid and accurate production, is being announced by the Cleveland Punch & Shear Works Co., Cleveland. Six standard sizes, ranging in capacity from 200 to 2000 tons pressure, are available.

The press illustrated has capacity of 1800 tons and a speed of 35 strokes a minute. The twin herringbone gears run in oil-tight cases, which provide the quiet operation desired in high-speed presses. The machine is equipped with a hand lever for "inching" the head when setting dies and with foot-treadle control for starting or stopping the slide instantly at any point of its stroke. When the press is used intermittently, a positive automatic stop brings the head to rest at the top of each stroke. A safety device set at a predetermined tonnage is provided, so that should the press be loaded beyond this point, no damage will occur.

Special attention has been given to the bearing surfaces for the slide. The slide is gibbed at both top and bottom to assure unusual accuracy even when the slide is at the extreme end of its stroke. Wedge adjustment to the bolster is provided; this is designed so that it may be adjusted in all directions for alining the dies.

This machine weighs 315,000 lb., has 17½ in. crankshaft frame bearings and 30½ in. crankpins. All driveshaft and intermediate shaft bearings are of roller type. The stroke is 12 in., the shut height of die space 29 in., and the bed and ram measure 60 in. front to back. If desired, the press can be arranged with automatic automaton for carrying either hot or cold material to the dies.

Sliding Gear Head Tool-Room Lathes

A NEW quick-change gear box with lead-screw reverse mechanism and anti-friction bearing end works are features of the eight and 16-speed sliding gear head tool room lathes built by the Reed-Prentice Corpn., Worcester, Mass., in 14, 16, 18 and 20-in. sizes.

Quick-change gear box provides 49 thread changes from 1½ to 96 per in., and 49 feed changes, from 0.0035 to 0.224 in. per spindle revolution. An auxiliary quadrant provides for any additional gears required for odd or metric threads, or for feeds not obtainable through the gear box.

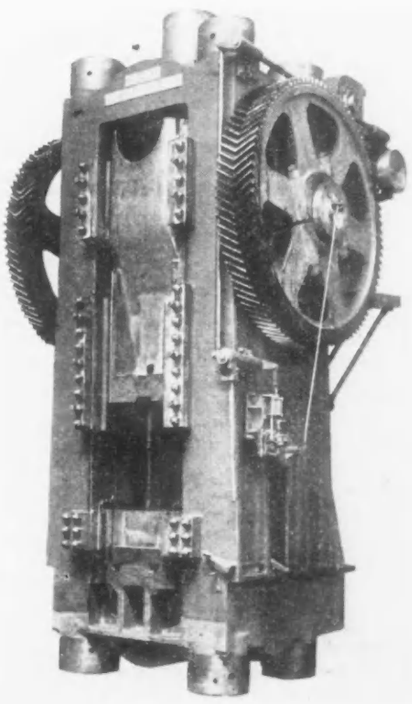
The lead-screw reverse mechanism provides for reversing carriage when feeding or threading without reversing direction of rotation of spindle. The reverse lever is located conveniently at right-hand side of apron. Adjustable stops provide for automatically stopping carriage when either feeding or threading in either direction at any predetermined point. The lead-screw nut remains engaged when stopping lead-screw and reversing, permitting ready catching of odd leads and metric pitches. A thread dial is provided for catching leads of long screws when carriage is run back by hand.

The entire end gear train and quick-change gear mechanism is mounted in anti-friction bearings. An oil pan with rolled edges and cabinet leg for the tailstock end can be supplied.

Teeth of Circular Saws Set Rapidly

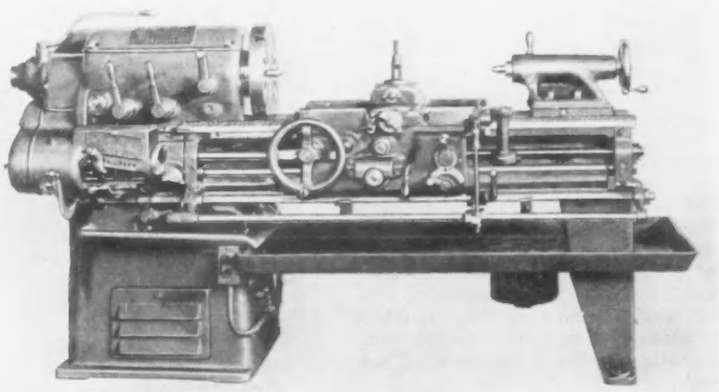
FOR setting the teeth of circular saws, the Wardwell Mfg. Co., Cleveland, has brought out the automatic saw setter illustrated. The saw is centered in a cone-type arbor that will accommodate saws having holes up to 2¾ in. in diameter. The saw slides near its outer edge between two anvils and the teeth are set by two setter points, one above and one below, that are actuated by a shaft and a 13-in. diameter hand wheel. The feeding or revolving of the saw is controlled automatically by means of a feed pawl at the back of the frame. Two teeth are set with each revolution of the wheel. The machine may be either hand or power operated.

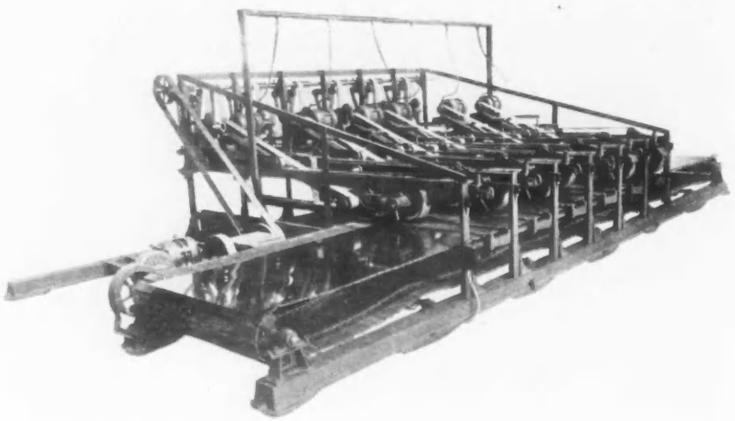
The machine will accommodate saws ranging from 5 in. to 38 in. in diameter, up to 8 gage in thickness and with teeth up to 1½-in. spacing. It is stated that it will set teeth at a speed of 150 to 200 per min.



(At left): New high-speed forging sizing press. *(Below):* Tool-room lathe featuring quick-change gear box with lead-screw reversing mechanism.

(At right): Teeth of saws from 5 to 38 in. in diameter are set rapidly on this machine.





Polishes Large Stainless Steel Sheets in One Pass

THE automatic stainless steel sheet polishing machine recently brought out by the Excelsior Tool & Machine Co., East St. Louis, Ill., is designed to polish sheets measuring up to 60 in. in width by 144 in. or more in length to a commercial finish in one pass under the polishing belts.

It is a "straight line" machine, and the process of polishing is continuous. Placed end to end on the endless belt conveyor, the sheets pass under a multiple number of roughing and finishing polishing belts at a constant speed, and are finished completely to the extreme edges in the one pass. A hold-down arrangement, consisting of rollers spaced equi-distant on each side of the polishing belts, prevents shifting of the sheet in process.

The polishing belts, which are 7 in. wide and 8 ft. long, operate over two end pulleys. The inside pulleys are driven direct by 10-hp. dust-proof ball-bearing motors and have a special intermediate idler pulley located between them for contacting the polishing belt with the sheet. This self-adjusting feature, producing uniform and constant pressure over the entire face of the polishing belt, is considered important in the success of the machine. Pressure on the polishing belts is regulated by means of weights. The loose pulley spindle is eccentrically mounted with a tightening device to maintain proper belt tension, thereby eliminating slippage of the polishing belts. Conveyor speeds are adjustable; they range from 60 to 120 lineal feet per hour. Spindles and other moving parts are provided with dust-proof housings wherever practical.

It is stated that when dull, the polishing belts can be removed and replaced in 2 min. without interfering with the operation of the other spindles. Belts may be reset easily with the desired abrasive, from 90 to 400 grain, by the means of a special fixture, which also functions to reduce the thickness of both edges of the belt and thus avoids feed marks on the polished sheets. Sheets do not become overheated or buckled; the spindles are located 3 ft. apart, allowing the sheet to cool considerably between each spindle operation, and the suction fan provided to remove the dust generated in polishing also assists materially in cooling the sheet between spindle operations. Cross travel of the spindle can be changed readily to conform to any width of sheet. No adjustment is necessary for the different metal gages.

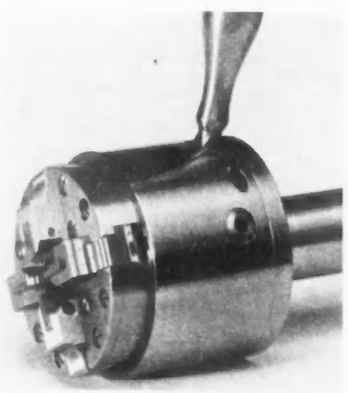
The machine illustrated, the No. 28, is a six-belt unit, which occupies floor space of 18 x 38 ft. and weighs approximately 32,000 lb. Machines with from 4 to 16 spindles can be furnished. On sheets having a minimum of rolling defects, the 16-spindle machine has capacity for polishing and buffing approximately 300 sq. ft. an hour to a high luster in one pass. The same output can be obtained by two passes through an eight-wheel machine.

Insert Chaser Die Head for Hand Screw Machines

THE Eastern Machine Screw Corpn., New Haven, Conn., has placed on the market an insert chaser die head for hand turret lathes and similar machines on which the die head does not rotate. This new stationary head, the style MS, uses the same insert chasers as the style MM H&G rotary insert chaser head described in THE IRON AGE of Oct. 1, 1931.

The inserted chaser principle is emphasized as eliminating idle machine time due to the necessity for sharpening chasers. Another advantage is that when new sets are installed, the set-up does not have to be changed. The chasers always project beyond the body the same amount, thus adapting the head for shoulder and chucking work. Chasers can be changed in less than 2 min. Size adjustment is made by means of a screw located conveniently on the front face of the head.

Simplicity is a feature of the head itself, there being only four principal parts—the body, sleeve, cam-carrier and shank. The die head is of pull-off type, the length of pull-off being sufficient to permit the operator to watch the head maintain its own lead. The operator does not have to control the lead. Bunting springs eliminate the necessity for a skillful start. The head is designed so that if the part threaded should become loose in the collet or chuck, the head may be tripped by a slight blow on the closing handle. An adjustable work stop may be fastened in the shank; this will trip the head by contact with the work.



The inserted chasers eliminate idle machine time due to chaser sharpening.

A REFRIGERANT gas leak detector for laboratory and field testing of electric refrigerators and refrigerator units is being marketed by the Turner Brass Works, Sycamore, Ill. Basically, it is an alcohol burning blow torch with a special burner housing that syphons its air supply through a rubber detecting tube. When the open end of tube is held in proximity to a leaky joint, the gas is syphoned through, and on striking the burner the color of the flame is changed from blue to green. This Turner-Hallide detector may also be used as a general service blow torch for soldering, heating of coils to expel gases, etc.

MONEY SAVING IDEAS

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Spoiled Work Tickets

A MANUFACTURER of cutting tools has reduced the amount of spoiled work by the simple expedient of adopting a plan which calls for a spoiled work ticket for each item discarded in process. Such tickets give the employee's name, the reason for the loss and other information desired by the accounting department. Four copies in different colors are made for each ticket. One copy goes to the accounting department, one to the works manager, one is used as a requisition for new material from the stores department to replace the spoiled part and the fourth copy goes to the inspection department. If the loss was the fault of the employee the card goes to a separate file to be filed after the employee's name. In this way a permanent record is built up for use in the promotion or discharge of men. One of the principal advantages of this system is the fact that at the end of each day the works manager knows from the number of spoiled work tickets brought to his desk just what the loss has been in this connection and why. The total amount represented by spoiled work is distributed to all work rather than to any one particular job.

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Salvage from the Scrap Pile

AN important fabricator of steel recently said, "Show me a manufacturer's scrap pile and I will tell you his shop deficiencies." This is perhaps a little exaggerated, but certainly much may be learned from a study of any manufacturer's scrap bins and during the present period of reduced working schedules most scrap piles offer an opportunity for valuable salvage work. If machine shop men are idle between jobs or it is desired to keep one or two men busy in order to hold them on the payroll an excellent plan is to turn them loose on the scrap bins. One manufacturer has found such an advantage in this work, which he started as an expedient to keep men busy, that he now has created a new job, which he calls salvager, which takes the full time of one man and more than pays expenses in the value of material salvaged. Naturally, some ingenuity is needed to make such a job successful. The manufacturer in question was fortunate in finding a neighboring plant which would buy three-inch steel disks and one of the principal jobs of his salvager was stamping these disks out of scrap sheet.

RESEARCH PAYS

MANY of the paragraphs presented on this page every other week describe short-cuts or economy wrinkles which have been uncovered through the activity of manufacturers' research departments. "During this period of deflation," says one manufacturer, "we have turned our research workers loose on the three major phases of our business; buying, fabricating and selling, and in this new field they have been giving an excellent account of themselves." Perhaps some of the discoveries of your own research department will interest others. Please address any communication to Forum Editor, Iron Age Publishing Co., 239 West 39th St., New York.

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Reclaiming Drills

DRILLS break down because of improper grinding, incorrect speed or feed, poor lubrication, lack of rigidity of work and for many other reasons which may be corrected and, of course, the first step in the reduction of cost of drills is to correct all of the preventable causes of breakage. However, many drills are broken because they encounter hard spots, or because of some other unpreventable accident. The expense of repairing broken drills often exceeds the salvage value. One manufacturer, after junking broken drills for many years, is now reclaiming these at a profit through the use of a comparatively inexpensive drill grinding machine which takes care of fast rough grinding, leaving the finish grinding to be done by hand in the usual way.

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Designs Gears for Greater Wear

AMONG gear users there is a saying that "gears wear out until they wear in," and there is general experience that the chief wear on a gear comes during the first few weeks of service. This initial wear is arrested by some manufacturers by tip relieving in the design of teeth. One manufacturer has gone still further in producing a gear which is exceptionally resistant to wear. He made up test gears in different materials and then studied the wear of these gears under different types of service. Following this he designed new gears as exact replicas of slightly worn gears, and as the wear on these test gears came in different points under different services he now produces new gears with special design according to the intended service and he claims that these are quieter and show less wear than gears of more conventional design.

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Reduces Cost of Galvanizing

THE resistance to corrosion of a galvanized sheet is determined by the thinnest part of the coating and therefore a uniform coating will save considerable material for the manufacturer. One steel producer has recently revamped its galvanizing department to secure a more uniform coating and has saved from 15 to 25 per cent in material as a result. The chief features in the change include a positive motor feed on the intake rolls to the galvanizing pot and also a positive motor-driven feed on the exit rolls. The pressure between the exit rolls is automatically controlled by pneumatic means and a new sensitive automatic control holds the temperature in the pot within narrow limits.

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Counter-Weighted Tongs for Forgings

WHEREVER heavy physical work in a manufacturing operation can be reduced an increase in production usually results. A manufacturer of universal joint forgings has increased production by using counterweights to balance the weight of tongs used in transporting the hot bars from the furnace to the steam hammer. The counterweight is attached to the balance point of the tongs by means of a light chain which passes over a ceiling pulley. When first installed this device interfered with the freedom of the operator and was discarded, but later the position of the furnace was altered to shorten the distance between the hammer and the hearth and now the counterweight feature is again in use with a noticeable increase in production.

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Selvedge Improves Strainer

WIRE strainers have a wide use throughout industry. Nearly every internal combustion engine has one or more strainers on its oil feed system. Circulating oil systems for heat treating usually have strainers to help keep the oil free from foreign material. A foundry doing extensive research on molding sands has found that strainer wire cloth made up with a double selvedge lasts longer and gives better results than with the usual uneven mesh. It seems probable that such a selvedged strainer would have many other advantageous applications. A manufacturer of wire screen is now making double selvedged strips in many widths.

American Eyes on Ottawa Conference; U. S. Largest Customer of Empire

THE industries of the United States, according to the National Foreign Trade Council, have spent approximately 33c. in the British Empire out of every dollar spent abroad for products during recent years. In 1929, the last normal trading year, we made 25 per cent of our purchases abroad from the British Empire, amounting to approximately one billion dollars, exclusive of $400,000,000 of purchases made by us from England herself. This is almost equal to the total purchases made by Great Britain herself from the British Empire. Since the depression, these values have changed, of course, but the proportions remain the same.

Our interest in the purposes of the conference is, therefore, far less that of a trade rival than that of an indispensable partner in imperial prosperity. Americans have more than $5,000,000,000 invested in the British Empire, and there are more than $1,600,000,000 of British Empire money invested in this country. We buy from Canada, moreover, 15 per cent more than all the entire British Empire, 50 per cent more than the United Kingdom, and 28 times as much as Australia and New Zealand combined.

Finally, so far as Canada is concerned, no recent developments, in tariffs or otherwise, have seriously altered the proportionate trade done between these two great friendly nations. Whereas, in 1911, 38 per cent of Canada's exports came to the United States, in the fiscal year 1931-2 that percentage had risen to 41 per cent. In 1911, 60.8 per cent of Canada's imports came from the United States and in 1931-2 the percentage was almost exactly the same at 60.7 per cent.

Bethlehem Employees Cultivate Gardens

Cultivating 7500 gardens, with a total value of produce estimated at $225,000, the employees of Bethlehem Steel Corpn. and subsidiaries have undertaken this summer one of the most extensive garden programs on record in industry.

In the Bethlehem steel plant communities there is an average of one garden for every seven employees. The number of square feet under cultivation in this activity totals 22,427,960. There are 5171 group gardens in communities at the steel plants and mines, 1722 supervised home plot gardens at the mines, and some 600 additional gardens of miscellaneous classifications.

The company says:

"The large activity in Bethlehem gardens this year may be accounted for by the economic situation and the interest of the management and employees' representatives in fostering the movement.

"Industrial gardens, of course, are not new, and are not new to Bethlehem. For a number of years the Bethlehem mining communities in Pennsylvania and West Virginia have been noteworthy in the quality of the employee gardens. In these areas supervised home plot gardens were more customary than group gardens, and prizes were offered by the company for the best home garden. This year, as there were not enough home plots to meet the demand, there also have been a number of group gardens in the mining areas.

"Among the Bethlehem steel plants, Lackawanna is the pioneer in having developed employee gardening on a large scale. Last year there were several hundred company plots on company land at Lackawanna."

Find the Forgotten Man

Automobile Output Lower in June

There was a slight decline in automobile factory sales in June, as reported by the Department of Commerce, whose total for last month is 183,092, compared with a revised figure of 184,284 for May. With Canadian production of 7112 added, the June total was 190,204, compared with 192,505.

The June figure brings the first half total for the United States to 871,423, compared with 1,572,935 for the corresponding period of 1931 and 2,198,580 for the first six months of 1930. Canadian production in the first half was 39,669, compared with 66,092 for the first half of 1931 and 110,685 for the like period of 1930.

Passenger car factory sales in the United States in June were greater than in May—160,103 against 157,683—but truck output declined from 26,528 in May to 22,754 in June. Taxicab output took a big jump in June, to 235 from 73 in May.

Fabricated Steel Orders Declined in June

Fabricated structural steel bookings in June, computed for the entire industry by the Department of Commerce from reports received from 256 companies, showed a decline, having totaled 86,800 tons, or 21.7 per cent of the total capacity, against 90,800 tons, or 22.7 per cent of capacity, in May. Capacity for the country is estimated at 400,000 tons a month.

In the first six months of this year, the total of computed bookings was 417,200 tons, against 1,105,200 tons for the first half of 1931 and 1,498,800 tons for the same period of 1930.

R. F. C. Asked to Finance Golden Gate Bridge

WASHINGTON, July 26.—The Reconstruction Finance Corporation has announced in a telegram to Governors of all States and Territories that it is receiving applications for loans for aid in financing self-liquidating projects. It is reported that it has already received many applications.

An Associated Press dispatch from San Francisco says that William P. Fillmer, president of the Golden Gate bridge and highway district, has announced that an application has been made to the R. F. C. to finance the projected $35,000,000 span.

Better Financial Foundations Laid for Recovery

By DR. LIONEL D. EDIE

THE rate of decline of bank deposits began to slow down three months ago and demand deposits outside New York City have shown signs of flattening out. This favorable development has taken place in spite of a continuing sharp decline in loans and investments and in spite of a period of demoralization of public confidence in May and June.

This has been a preliminary sign of a halting of credit deflation. It was precisely the result which the Federal Reserve policy of buying Governments was designed to accomplish. The time lag has been somewhat greater than might have been necessary under less adverse conditions, but the result cannot be ignored.

This credit improvement has been closely related to the halt in the decline of commodity prices. Prices and credit have moved arm in arm throughout the downward course of the last three years. Now the momentum has been halted. If these two factors are able to stabilize and even to show some firmness, the reserve policy will have been vindicated.

Gold Standard Crisis Over

In the meantime, the United States has passed through a gold standard crisis and has survived it. This crisis began with the introduction of the Goldsborough bill in the House. Some observers believe that the Federal Reserve policy itself started a scare which led to gold outflow, but this claim is open to serious doubt.

Whatever the cause, the gold outflow has been halted and a mild import movement has appeared. The balance of payments of the United States tends to exert pressure in the direction of gold imports. This is due mainly to the service charges due on our foreign investments, to the decline in our tourist expenditures abroad, and to our unwillingness to make new foreign investments.

There are some reasons for wondering if a renewed strain on our gold position may not appear next winter, but certainly for the time being the American people have occasion to cease worrying about gold. This fact may prove to be one of the great landmarks of the depression.

With the adjournment of Congress, the scares about inflation and unsound money were put to rest and should stay at rest, at least until next December.

The Glass bill displaced the Goldsborough bill. The significance of the Glass bill is not any likely net addition to currency but a partial substitution of National bank notes for Federal Reserve notes. This economizes in gold reserves, and is a substitute for further purchases of Government securities by the Federal Reserve.

An unbalanced budget is the most serious threat to sound money. The budget is probably not genuinely balanced, but progress has been made in the right direction, and for the time being the public is willing to stop worrying about the subject while Congress is out of session. New political battles will be fought on taxes and economy next winter, but a breathing spell is afforded for several months.

International Financial Questions Move Toward Solution

The Lausanne agreement on reparations did not settle the question with finality, but it did have the virtue of introducing a new spirit of conciliation.

During recent weeks, a conviction has grown up in informed quarters that the United States will agree to a readjustment of war debts next winter, on the basis of mutuality of sacrifice among the nations affected.

Confidence now exists that war debts will be settled. An effort will be made to keep the issue out of our election campaign, but in Europe, as well as in the United States, competent observers are for the first time able to adopt a hopeful attitude toward a settlement.

The British conversion of debt from a 5 to a 3½ per cent basis introduced a period of extremely cheap money in England and firm prices of high-grade bonds.

It would appear that the American market is being groomed for a refunding of some of the unwieldy floating debt in this country in a long-term issue at a low rate.

There is an element of artificiality in cheap money and conversion, but the end may justify the means.

Foreign holders of British bonds will probably show some reluctance to convert, and this factor may produce weakness in the pound sterling between the present date and Dec. 1.

Elements of Financial Improvement

These, then, are the elements of financial improvement thus far:

1. An abatement in the decline of bank deposits.
2. A halt of the commodity price debacle.
3. Apparent stabilization benefits from Federal Reserve policy.
4. Ending of a gold standard crisis.
5. A truce in the worries about sound money, coupled with adjournment of Congress.
6. The Lausanne reparations agreement, followed by confident expectations that war debts will be adjusted after the elections.
7. Conversion of public debt in England and prospects of refunding of floating debt in the United States.

These are some of the tap roots of the better feeling abroad, which in turn is reflected in stronger security markets. Basic industry does not yet reflect the change, and cautious people will not be too quick to take recovery for granted. Better financial foundations for recovery have been laid and they will be tested during the next six months.

Urge Local Engineers' Relief Activities

To arrange for relief work for engineers during the coming winter, the various local sections of the American Society of Mechanical Engineers have been urged to call meetings of the active representatives of engineering groups to organize for the collection of funds against the development of needs later on. The emphasis has been placed on cooperative activities to avoid separate funds for the different engineering groups and to include architects and chemists as well. Meanwhile the Professional Engineers Committee on Unemployment, which operated for the New York metropolitan district last winter, is making preparations for active canvassing of funds for the coming winter to develop work and care for engineers in dire straits.

"Combustion" is the title of a book of over 200 pages issued by the American Gas Association, New York. Though this is the third edition, it is represented as entirely new. Its 12 chapters, well illustrated, cover such subjects as gas volume and pressure, chemistry of combustion, combustion data of commercial gases, gas analysis, fuel comparisons and so on.

Hoover Program Expected to Stimulate Railroad Buying

Conferences with Railroad Leaders Believed to Have Laid Basis for Large Expenditures, Particularly for Maintenance

WASHINGTON, Aug. 2.—The iron and steel industry has shown particular interest in that part of the administration program for economic recovery announced last Friday which relates to proposed expansion of railroad buying. This apparently looks to large volume purchases for repairs, maintenance, supplies and equipment. The statement issued by President Hoover announcing the program, however, does not go into details sufficiently to make clear just how extensive purchasing would be, if actually determined upon.

That part of the "economic recovery" program relating to railroad purchases says:

> Preliminary conferences have taken place with some of the railway leaders with a view to their developing programs for increased repair and maintenance in cooperation with the agencies of the Government for the purpose of expanding railway employment and for expansion in orders for railway supplies and equipment, which would also be immediately reflected in increased employment in the supply and steel industries.

It is assumed reference to preliminary conferences with railroad leaders means those that have been held at the White House and the Treasury. The latest conference was held on Thursday of last week at the Treasury by Secretary of the Treasury Mills and Secretary of Commerce Lamont with three railroad presidents, W. W. Atterbury of the Pennsylvania, Daniel Willard of the Baltimore & Ohio and Hale Holden of the Chicago, Burlington & Quincy. No statement was forthcoming from the conference, but it is understood that the Government officials laid before the railroad presidents suggestions for increased loans from the expanded Reconstruction Finance Corporation for large-scale buying, especially for repair and maintenance work. New supplies and equipment also are said to have been taken into account but the view has been emphasized that railroads now have some 700,000 idle cars and 10,000 idle locomotives and do not need new rolling stock. Rather the need is for repairs, and the conference apparently bears on the report published last week in THE IRON AGE that the Government is seeking to persuade the railroads to repair upward of 500,000 freight cars, calling for 2,000,000 to 3,000,000 tons of steel. Rail purchases also are said to have been considered.

At the same time it is well known that the railroads are adhering as strictly as possible to a retrenchment program and are chary about engaging further indebtedness unless they see an early return on their investment in the way of improved business.

Whether the Government has offered any particular inducement for large-scale purchases by the railroads through the Reconstruction Finance Corporation or other sources is not known. It will be observed that the statement refers to "the agencies of the Government" and seemingly it has references to some policy that is not confined solely to Reconstruction Finance Corporation financing.

Other Features of Program

The program announced by the President contemplates coordination of that organization with other Government agencies, and the use of the funds of the Reconstruction Finance Corporation for varied purposes. Of the $3,800,000,000 back of the corporation, it has available $1,500,000,000 to finance self-liquidating projects which will require heavy steel tonnages, metal-working machinery and foundry products. The President pointed out that an engineer of standing will be delegated by the Army Engineer Corps as chairman of the board of outstanding engineers to advise the corporation in respect to these works "with view to the most expeditious action in stimulating employment by starting of the work and the placing of orders for material." The character of these self-liquidating projects have been previously pointed out by THE IRON AGE. They include public bridges, tunnels, river work, etc.

The program of the President also refers to plans to make use of increased powers of the Reconstruction Finance Corporation to widen credit facilities to business and industry "for production where consumption of goods is assured and thus expand materially employment which has been hampered by dislocation of the credit machinery." The program made it known that preliminary consideration is being given to "other avenues of cooperation between the Government in aid to private and public agencies." It likewise announced that the President has under discussion "with various agencies the question of a movement to further spread existing employment through reduction of work hours."

Wider Publicity for Loans Looked For

It is believed that before long these plans will take on a definite shape. In this connection it is believed that the Reconstruction Finance Corporation, under the chairmanship of former Senator Atlee Pomerene of Ohio, will change considerably from its past tight-lipped policy to a policy of wider publicity. The policy of the corporation in not announcing applications for bank loans has been almost universally approved, but otherwise its policy of making public only routine matter has been strongly assailed and has hurt its standing.

The President said that when the "economic recovery" program is more fully developed he will confer with the "business and industrial committees created in each Federal Reserve district and other groups in the country that are primarily interested, with view to establishing united and concerted action on a broad front throughout the country."

Gray Iron Output Off in June

Production of gray iron castings during June was 34.5 per cent of normal, as compared with 39.8 per cent during May, according to the monthly report of the Gray Iron Institute. New business declined to 26.8 per cent in June from 30.3 per cent in May, and unfilled orders declined to 23.2 per cent from 25.5 per cent in May.

The greatest activity was in the Central Western district, in which Pennsylvania, Michigan, Ohio and Indiana are included. Foundries in this district operated at 38 per cent of normal, as against 45.5 per cent in May. Production in Wisconsin, Illinois and the territory west of the Mississippi River was 33.4 per cent in June as against 39.5 per cent in May. In New England, New York and New Jersey the June production was 29.3 per cent, as against 29.9 per cent during the previous month. In the Chicago district the June production was 36.6 per cent, as against 40.6 per cent during the previous month.

None of the foundries reported a good business outlook. Seventeen reported a fair, 36 a poor and 45 a bad outlook.

A comprehensive presentation of data covering copper, brass, bronze and other metal products of the Revere Copper & Brass, Inc., New York, is contained in an attractive, illustrated catalog, 76 pages, 8½ x 11 in. For convenient reference, the various products are grouped according to physical form, as follows: sheets, rolls, strips and anodes; thin metal; plates; sheet metals; rods, wire and drawn copper and commutator copper; extruded and drawn shapes; tubes and pipe; die pressed and hammered forgings; welding rods; soldering coppers and rivets and burs. Data covering physical properties, analyses, price extras, dimensions, etc., are given, and 22 pages are devoted to other useful information such as conversion tables, wire gages, weight tables, etc.

OFF THE ASSEMBLY LINE

July Marked a Substantial Reduction in Automobile Production; Sales Outlook Better

DETROIT, Aug. 1.

A SUBSTANTIAL let-down in the activities of the motor car industry took place in July. Final figures on both production and sales will show considerable shrinkage from the modest seasonal peak attained by production in May and by retail sales in June. Complete returns which are now available on June registrations of new passenger cars in all States, except Georgia, showed a total of 147,537, or a gain of 13.6 per cent over the May total of 129,842. Although showing a gain over the preceding month, June registrations were 26.1 per cent under June last year.

June production of cars and trucks in the United States and Canada fell slightly below the May total, 190,204 units comparing with 192,505, according to the Department of Commerce. Truck production declined to 23,558 from 27,486 in May. Aggregate production of cars and trucks in United States alone during the first half of 1932 was 871,423 units, compared with 1,572,935 in the first half of 1931, a decrease of 44.6 per cent.

Except for Hudson, which is rushing production on its recently announced Essex Terraplane, curtailment is general throughout the industry. Ford has virtually ceased production of four-cylinder passenger cars and is concentrating on the V-8, on which daily output is around 3000 units. A relatively small percentage of fours is still being assembled, however, by the branches. Ultimately Ford plans to make the eight his standard passenger car, while the four will continue as the Ford commercial vehicle and to meet the requirements of fleet owners and the small percentage of buyers who prefer a four-cylinder passenger car. Production of the V-8 is now in sufficient volume to meet demand. Reports of large-scale layoffs at the Ford plant have been denied by the company with statement that employment continues within 5000 or 6000 of the high point of around 90,000 this year.

Hudson Motor Car Co. has taken delivery on materials for the completion of 10,000 of its new Terraplanes, which output is expected to be reached early in August. July production of the new cars was expected to total 5000 and the company plans to build between 15,000 and 20,000 in August. Hudson officials are highly encouraged over the reception accorded the new car. During the first day's showing in Detroit 35 sales were made on the floor of the main sales room. Attendance at the Broadway showroom on Monday last week, when the cars were first shown in New York, averaged 400 an hour. It is only within the last few days that the cars have been displayed generally in leading cities of the country.

Production in first half fell 45 per cent below that of a year ago.

* * *

Reception of new Hudson Terraplane is gratifying and August output will be from 15,000 to 20,000 units.

* * *

Sentiment has improved among automobile retail organizations. The strong demand for used cars, coupled with the dwindling supply, is expected to result in a larger movement of new cars.

* * *

New rust-proofing process is applied to complete body assemblies.

Steel companies anticipate comparatively little business from the motor industry in the current quarter. The seasonal dullness which developed in July is expected to continue into September, since most companies are cleaning up on old lines and are not yet ready to make commitments for their new models. During September, however, inquiries are likely to start coming in on new specifications. There is some hope, however, that the renewed confidence which is beginning to appear throughout the country may generate a slight upturn in motor car sales, or at least prevent further shrinkage.

Improved Sentiment in Retail Organizations

Despite the current low level of activity, the motor executives are heartened by the improved sentiment among their field organizations. To the more optimistic this presages rising sales within the near future, and some go even so far as to say that a substantial upturn is likely to develop before the close of the year.

In addition to the improved sentiment in the retail organizations, who reflect the attitude of the buying public, motor executives base their hopes on the low stocks of both new and used cars. Almost without exception, dealers' new car inventories are extremely low, and any upturn in buying will be reflected immediately in increased production at the factories. One of the most encouraging features of the retail situation has been the strong demand for used cars, particularly in the low-priced bracket, and a steady dwindling of used car stocks. During June, stocks of used cars in the United States were reduced 10 per cent and during the first 20 days of July were cut down by an additional 16 per cent. This situation is certain to reflect itself in a freer movement of new cars.

Two New Reo Commercial Cars Introduced

Reo Motor Car Co. announces the introduction of two new commercial vehicles, a 2-ton six-cylinder speedwagon at $1,095 and a heavy-duty 4-ton eight-cylinder truck at $2,995. Both are powered by Reo-built Gold Crown truck engines and are available with complete lines of standard and special bodies, Reo-designed and built in the company's truck body plant. Each truck is available in several wheelbases and each is supplied in tractor-trailer combination with gross

(Concluded on Advertising Page 14)

Iron and Steel Imports Lower in June; Belgium Principal Source for Steel

WASHINGTON, Aug. 2.—Imports of iron and steel products in June showed a small decline to 34,494 tons from 39,751 tons in May. Outgoing shipments in June were only 52,081 tons. Taking exports of 21,837 tons of scrap out of the movement, the total slumped to 30,244 and left the balance of the international iron and steel trade in favor of imports, after allowing for the 245 tons of scrap received. Omitting exports of 115,595 tons of scrap in the first half of 1932 and likewise eliminating 4203 tons of scrap which was imported, the outgoing shipments in that period exceeded incoming shipments by a bare 937 tons, the respective movements being 206,140 tons and 205,203 tons.

Pig iron led by far in imports in June, totaling 14,604 tons, of which 6034 tons came from the United Kingdom, 5815 tons from the Netherlands, and 2515 tons from India.

As the Division of Statistics, Department of Commerce, changed its plan of reporting imports by which individual items would have been grouped, and left them unchanged, the single items have been continued in the list. Protests were made against the contemplated revised plan.

The largest tonnage of rolled products imported consisted of concrete reinforcement bars, amounting to 3428 tons, of which 3304 tons came from Belgium. Ranking second were merchant steel bars, totaling 3173 tons, of which 1631 tons came from Belgium, 692 tons from Germany, 674 tons from France and 149 tons from Sweden. Of the 2044 tons of structural shapes imported, 1139 tons came from Belgium and 776 tons from France.

Canada supplied 1674 tons of the 2889 tons of ferromanganese imported; United Kingdom, 504 tons; Germany, 477 tons, and Norway, 234 tons. All of the 3519 tons of manganese ore imported came from Soviet Russia.

Belgium led as the source of imports, furnishing 8755 tons. Next came the United Kingdom, 6937 tons, closely followed by the Netherlands, 6375 tons.

United States Imports of Pig Iron by Countries of Shipment

(In Gross Tons)

	June		Six Months Ended June	
	1932	1931	1932	1931
United Kingdom	6,034	296	16,352	1,641
British India	2,515	7,509	21,906	43,686
Germany	....	....	135	52
Netherlands	5,815	1,251	35,392	6,146
Canada	....	77	138	77
France	....	....	....	25
Belgium	....	....	200	100
Norway	102	....	102	86
Sweden	138	200	397	3,277
All others	....	....	581	733
Total	14,604	9,333	75,203	55,823

Sources of American Imports of Iron Ore

(In Gross Tons)

	June		Six Months Ended June	
	1932	1931	1932	1931
Canada	42	40	770	202
Cuba	....	11,000	55,000	34,000
Chile	13,304	65,944	218,492	484,465
Spain	....	....	49	28,327
Sweden	....	....	7,037	37,223
Russia	16,450	15,424	98,060	181,009
French Africa	....	11,460	10,000	51,842
Other countries	15,172	18,019	67,746	75,498
Total	74,968	121,896	457,154	892,576

Imports of Iron and Steel Products into the United States

(In Gross Tons)

	June		Six Months Ended June	
	1932	1931	1932	1931
Pig iron	14,604	9,333	75,203	55,823
Sponge iron	....	....	51	209
Ferromanganese*	2,889	1,898	14,240	15,054
Ferrochrome†	25	25	126	96
Ferrosilicon‡	....	26	32	551
Other ferroalloys	....	180	625	790
Scrap	245	1,341	4,263	7,648
Pig iron, ferroalloys and scrap	....	....	....	....
Steel ingots, blooms, billets, etc.	21	1,622	2,628	11,628
Wire rods	457	564	3,522	3,965
Semi-finished steel	....	....	....	....
Concrete reinforcement bars	3,428	3,771	19,588	22,250
Hollow bar and drill steel	44	144	358	767
Merchant steel bars	3,173	4,128	19,121	23,905
Iron bars	5	214	261	551
Iron slabs	11	....	11	40
Boiler and other plate	178	8	878	629
Sheets, skelp and saw plate	1,058	1,856	10,591	11,309
Tin plate	43	7	7,191	59
Structural shapes	2,044	6,338	17,339	37,155
Sheet piling	....	....	....	579
Rails and rail fastenings	144	172	1,817	3,782
Welded pipe	394	689	2,194	3,561
Other pipe	127	261	1,544	5,236
Barbed wire	1,759	857	8,334	3,496
Round iron and steel wire	199	280	1,195	1,561
Flat wire and strip steel	56	25	493	267
Wire rope and strand	197	206	1,030	1,067
Other wire	86	26	455	647
Hoops and bands	2,382	1,623	11,644	8,592
Nails, tacks and staples	998	850	5,271	3,957
Bolts, nuts and rivets	16	6	81	524
Other finished steel	7	....	32	184
Rolled and finished steel	....	....	....	....
Cast iron pipe and fittings	2	1,112	25	5,285
Castings and forgings	*122*	*123*	*378*	*1,807*
Total	34,494	39,751	209,106	232,842

*Manganese content only.
†Chromium content only.
‡Silicon content only.

Construction contract awards in the 37 States east of the Rocky Mountains in the first half of July amounted to $70,505,000, according to F. W. Dodge Corpn. This total compares with $57,813,100 for the first half of June and $137,278,800 for the corresponding half-month of July, 1931. Of the current July total $28,481,700 was for non-residential building, $10,077,500 was for residential building and $33,945,800 was for public works and utilities.

... PERSONALS ...

J. E. MONTGOMERY, formerly vice-president in charge of operations of the Wheeling Steel Corpn., Wheeling, W. Va., has been appointed assistant to the president of the Otis Steel Co., Cleveland, according to the announcement of E. J. KULAS, president of the Otis company. Mr. Montgomery has had 30 years' experience in the steel business, his first association having been with the American Sheet & Tin Plate Co. In 1914 he became associated with the Whitaker-Glessner Co., which later became part of the Wheeling Steel Corpn., and was advanced to vice-president of that corporation.

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MARK F. LACEY, of New Britain, Conn., has been made vice-president in charge of sales of Peck, Stow & Wilcox, Southington, Conn.

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MACGILVRAY SHIRAS, for more than 20 years ore agent in charge of raw materials for the Carnegie Steel Co., Pittsburgh, has been made a director of the Carnegie Steel Co. of New Jersey, Carnegie Steel Co. of Pennsylvania, Clairton By-Product Co., and Clairton Steel Co., all of Pittsburgh. Mr. Shiras has been with the Carnegie company since 1893, when it took over the old National Steel Co., of which he was then serving as chemist. He has been in charge of various blast furnace plants of the Carnegie company, but in more recent years has given special attention to iron ore, particularly in the Lake Superior district.

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R. E. WILLIAMS has been made president and general manager of the D. A. Ebinger Sanitary Mfg. Co., Columbus, Ohio, succeeding D. H. Ebinger, who has resigned. Other officers elected by the board of directors on July 13 are F. J. HEER, vice-president and chairman of the board; G. S. MCKEE, vice-president and works manager; E. E. FOX, vice-president and treasurer, and A. E. SMITH, secretary and sales manager.

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C. W. KINTER, for the past 20 years chief engineer of Follansbee Brothers Co., Follansbee, W. Va., has resigned. A new unit for rolling tin plate has just been completed at the Follansbee plant under his supervision. Before going with the Follansbee company, Mr. Kinter had a varied experience, having been connected with the Duquesne works of the Carnegie Steel Co., the McKeesport works of the National Tube Co., the Pittsburgh Seamless Tube Co., and the National Roll & Foundry Co. Mr. Kinter is taking advantage of the present inactivity of the industry to devote his time to personal interests.

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WILLIAM R. BECK has been appointed general sales manager of the Atlantic Foundry Co., Akron, Ohio. He was formerly manager of sales engineering with the Fort Pitt Steel Casting Co., McKeesport, Pa., and for eight years served as manager of sales with the Massillon Steel Casting Co., Massillon, Ohio. During and after the war, he operated an iron foundry in Detroit. Mr. Beck is a graduate in mechanical and metallurgical engineering of the Case School of Applied Science.

J. E. MONTGOMERY

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E. J. DALTON, president, Yates-American Machine Co., Beloit, Wis., has accepted appointment as general manager, General Refrigeration Co., Beloit, succeeding the late James R. Morash. For the present Mr. Dalton will devote all of his time to that industry. He will continue as president of the Yates-American company, of which ALVIN HAAS is general manager.

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JAMES D. CUNNINGHAM, president, Republic Flow Meters Co., Chicago, has been made a member of the board of trustees of Armour Institute of Technology, Chicago. Mr. Cunningham has for some time been chairman of the development committee of the institute.

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PAUL M. HAAS, formerly auditor of the Campbell plant of the Youngstown Sheet & Tube Co., has been appointed assistant to President FRANK PURNELL, and will take over some of the duties formerly handled by R. M. WELCH, assistant secretary and assistant treasurer. J. C. JOHNSON, former assistant plant auditor at the company's Campbell works, has been named to succeed Mr. Haas.

R. E. ARNOLD has been made New England representative, at 84 State Street, Boston, for the Mills Co., Cleveland, maker of partitions.

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JOSEPH T. MCGARVEY, Federal inspector of motors at the Pratt & Whitney Aircraft Co., Hartford, Conn., has been made a member of the Connecticut Aviation Commission to fill the unexpired term of HIRAM P. MAXIM, who has resigned. His commission term will expire in December, 1933.

Cleveland Club Honors Steel Corpn. Officials

William A. Irvin, president, and Charles L. Wood, vice-president, United States Steel Corpn., were honor guests at a luncheon held at the Union Club, Cleveland, July 28, during a visit to that city to inspect Steel Corporation plants. Harris Creech, president, Cleveland Trust Co., presided at the luncheon, which was attended by a number of other prominent iron and steel men. Among those present were J. S. Keefe, president, American Steel & Wire Co.; Clement V. McKaig, vice-president, Carnegie Steel Co.; A. F. Harvey, president, Pittsburgh Steamship Co.; John A. Coakley, C. F. Blackmer, D. A. Merriman, vice-president, and A. F. Allen, treasurer, American Steel & Wire Co.; H. G. Dalton and Frank Purnell, chairman and president, Youngstown Sheet & Tube Co.; William G. Mather and Donald B. Gillies, chairman and president, Corrigan, McKinney Steel Co., Tom Girdler, chairman and president, Republic Steel Corpn.; E. J. Kulas, president, Otis Steel Co.; F. C. Hardie and A. R. Willard, Cleveland district sales manager and assistant manager respectively, Carnegie Steel Co.; W. L. Fay, president, Greenville Steel Car Co., Pittsburgh; Edwin Hodge, Jr., chairman, and Fred D. Foote, president, Pittsburgh Forgings Co.; D. J. Champion, president, Champion Rivet Co.; Anthony Carlin, president, Anthony Carlin Co.; George S. Case, president, Lamson & Sessions Co.; John C. Chandler, Cleveland sales manager, Bethlehem Steel Co., Cleveland, and C. G. Conley, president, Mount Vernon Bridge Co., Mount Vernon, Ohio.

To Manufacture Shim Steel

American Shim Steel Co., New Kensington, Pa., has been organized for the manufacture and distribution of shim steel. C. Thomas Best, formerly purchasing agent for a Pittsburgh steel company, is president of the new organization.

OBITUARY

DR. ADOLF KREBS, who died suddenly on June 15, was treasurer of the General Welding & Equipment Co., Boston. He was prominent as an inventor and engineer and as an authority in the oxyacetylene welding industry; in the latter his development of oxyacetylene cutting machines was outstanding. He was born in 1864 in Wiesbaden, Germany, and was educated at the University of Berlin and the Charlottenburg Polytechnic Institute. Dr. Krebs held important engineering and administrative positions with the German General Electric Co. and Siemens & Halske, and represented the latter at the World's Fair in Chicago in 1893. He finally settled in this country in 1908. He was author of "Modern Steam Turbines and Turbine Ships," published in German and French in 1904, and of "Cutting With Oxygen," published in 1926 in Boston. His son, Carlos Krebs, was associated with him in his business.

ADOLF KREBS

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JOHN P. JORDAN, for the past seven years a member of the firm of Stevenson, Jordan & Harrison, New York, management engineers, died suddenly at his home in that city on July 23, aged 54 years. He attended Brown University, where he specialized in mechanical engineering. On leaving college, Mr. Jordan became associated with the Lackawanna Steel Co., in the construction department, and occupied various executive positions. Having become interested in the necessity for applying engineering principles to organization and management problems, he gave up his position in 1903 and entered the industrial engineering field. Besides his business pursuits, he lectured on organization problems at New York University for six years and gave special lectures at the Harvard Graduate School of Business Administration, Pennsylvania State College and Massachusetts Institute of Technology. He was a member of the American Management Association, American Society of Mechanical Engineers and Society of Industrial Engineers.

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JAMES MCWILLIAMS, vice-president and treasurer of the Watson Machine Co., Paterson, N. J., died at his home after a long illness on July 21, aged 66 years. He had been identified with the company for over 50 years.

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JAMES HUGHES, pioneer foundry owner of Wisconsin, died July 24 at his home in Cedarburg, Wis., aged 75 years. He was born in Brookfield, Wis., and served his foundry apprenticeship in Milwaukee. In 1879 he founded the Eagle Iron & Brass Foundry Co. at Green Bay, Wis., then the largest shop north of Milwaukee. Mr. Hughes later was superintendent of the Giddings & Lewis Mfg. Co., Fond du Lac, Wis., for eight years. He retired in 1921.

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CHARLES E. WATERSON, president of the Sheffield Machine & Tool Co., Dayton, Ohio, died of a heart attack at his home in that city on July 24, aged 61 years. Early in his business career he became identified with the Patterson Supply Co. Later he organized Biggs Waterson Co., machine tool dealer, Cleveland. In 1917 he organized and became president of the Sheffield company.

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THOMAS H. ALISON, president of the Bergen Point Iron Works, Bayonne, N. J., died at his home at that city on July 2, aged 49 years. His death closely follows that of his predecessor as president of the company, AUGUSTUS SMITH, Roselle, N. J., who died about four months ago. Mr. Alison was born at Toronto, Ont., and studied engineering at the University of Toronto. He had been associated with Mr. Smith in a number of engineering projects, including Government coaling and lighthouse stations in the Canal Zone.

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HENRY HAMPTON KERR, vice-president of United Engineers & Constructors, Inc., Philadelphia, died suddenly in Chicago on July 21. He was 65 years old.

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HAROLD FLOWER, managing director, Copper Miners' Tin Plate Co., Ltd., of Cwm Avon, Glamorgan, and closely associated with the Welsh tin plate trade for over 40 years, died suddenly on July 18, aged 64 years.

Ohio Coal Rates Sharply Reduced; Some Steel Plants at Disadvantage

A CONDITION of turmoil has developed in the Ohio coal rate situation as a result of sharp rate reductions by the Wheeling & Lake Erie Railroad on fuel to certain iron and steel centers in that State, and there is a possibility that an upheaval of existing coal rates may extend to interstate traffic in both steam and coking coal. The iron and steel industry is vitally interested in the matter, particularly because some of the leading iron and steel companies have been put at a disadvantage because their plants are situated at points that are not benefited by the rate reductions.

The rate disturbance started with a recent reduction by the Wheeling & Lake Erie Railroad from $1.26 to $1.08 for southeastern Ohio district coal for Massillon and Canton. This was followed by a rate reduction from $1.01 to 80c. for coal from the middle Ohio district to these two consuming points. Last week the same railroad reduced the coal rate from the southeastern Ohio district to Cleveland from $1.74 to $1.45 and from the middle Ohio district to Cleveland from $1.54 to $1.22. Other affected railroads demanded a suspension of the rates, but the Ohio Public Utilities Commission on July 30 refused to grant a suspension. Being unable to secure a suspension, the other railroads will hold a meeting this week to decide whether they will meet the new rates.

Cleveland is a key point in the coal rate structure and a differential of 10c. a ton has prevailed between the western Pennsylvania rate and the Ohio rate on coal for shipment to Cleveland. With the new reduced rate, this differential has been increased to 39c., much to the disadvantage of the Pittsburgh district operators. The matter is likely to be carried to the Interstate Commerce Commission.

Another interesting development in the coal rate situation is the establishment by the Wheeling & Lake Erie Railroad of a through coal rate from mines to leading industrial centers at Canadian points in Ontario, these being a combination of rail and water rates. In addition to naming the through rates to Canada, the Wheeling & Lake Erie will collect freight charges at destination and accept payment in Canadian funds, although the Canadian dollar now is worth only about 83c. in American money.

• • EDITORIAL COMMENT • •

Steel Industry May Soon Use More Scrap

WITH steel scrap prices lately at far below the historic lows there has been a great disparity between the cost of scrap and the integrated cost of making pig iron, pointing superficially to there being much more scrap, relative to pig iron, used in steel making. There were in the past reasons against such a course but of late the weight of these reasons has been reduced.

There was, for example, the apparent necessity of keeping by-product coke ovens in operation, but it has been found possible to double the normal coking time. It is also believed that the experiment of banking or covering ovens, to bring about very slow cooling, will be successful, leaving retort walls intact. It was previously desired also to keep some blast furnaces in operation the output of which was not required, but it has been found feasible to gait furnaces down much more than formerly. According to THE IRON AGE blast furnace report for June, there was an average daily production per furnace of not over 425 tons, whereas the American Iron and Steel Institute report showed average daily production of furnaces in blast of 585.2 tons in 1929 and 603.5 tons in 1930. Very little iron ore is being brought down the lakes this season and relatively little liquidating of ore stocks remains to be done.

When steel production increases there will be no great occasion for larger utilization of by-product coke ovens and blast furnaces, as a fairly comfortable low pace has been set, and there will be more room for scrap. As to general economic advantage to the country, it is easy to count up the labor employment at ore and coal mines and at coke ovens and blast furnaces involved in making pig iron, but something is to be said for scrap also. A heavier movement of scrap would furnish cash, coming in very handy, to industries with worn out equipment and with new scrap. It would furnish employment to junkers and scrap yards and no little railroad traffic, for all scrap pays high freight rates and some of it moves long distances.

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Using American Ships

AT present American ships carry only about one-third of the commerce of this country. Chairman T. V. O'Connor of the Shipping Board has pointed out that if this business could be doubled, the cash benefits that would accrue to the merchant marine would reach the sum of $600,000,000 annually.

There is hardly an industry that does not supply materials and equipment for a ship and these come from all of our States. Consequently not only producers of raw materials but railroads, manufacturers and finance would be stimulated through the fuller utilization of our own shipping.

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"Never Say Die," Say Automobile Makers

WITH industry suffering from the blight of the depression, perhaps the easiest thing for a company to do is to conclude that its market has dried up, nothing can be done about it and the only recourse is to set up a period of watchful waiting.

In sharp contrast with this defeatist philosophy is the automobile industry which may be cited as a shining example of courage, aggressiveness and the never-say-die spirit. The automobile people are not sitting back in swivel chairs, bemoaning their misfortunes. They are out on the firing lines of research, production and selling.

Here are bits from one day's news of the industry: Hudson Motor Car Co. brings out its new, low-price car named the Terraplane. Chrysler is taking bids on new machine tools for the tooling up of new models. General Motors is restyling the bodies of its various cars, promising something sensational. Chevrolet has been conducting a campaign among motorists with cars two years old or older. DeSoto's general sales manager and his staff leave for a series of dealer meetings throughout the country to push the merchandising of the DeSoto car. A general sales drive of substantial proportions on the part of the entire industry is planned for this fall.

Other industries might well take heart from this exhibition of courage. That it is not without its measures of success is shown by the sales results which have been achieved in the face of perhaps the greatest sales resistance which the industry has encountered in its history.

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Publicity for R. F. C. Loans

WHILE applications are not being made public as yet, it is certain that the Reconstruction Finance Corporation can no longer continue its former tight-lipped attitude of no publicity. The new act requires publicity; at least monthly reports must be made to Congress, and there is a difference of view as to how far this provision may go. Unfortunately, it has slipped into politics. But some sort of publicity seems inevitable, and in the absence of Congress this rests with officials of the House and Senate. Publicity of bank loans was properly banned. But publicity of applications for self-liquidating projects and many other of the new purposes provided should be made compulsory. The people are giving the money and deserve an accounting of its use. Moreover, the publicity will be stimulating as it applies to self-liquidating projects. It will mean the wheels are going to be started.

July Daily Output of Pig Iron Declined 11.8 Per Cent

PRODUCTION of pig iron in July was 572,296 gross tons, compared with 628,064 tons in June. The loss in the daily output of July from June was 11.8 per cent, or from 20,935 gross tons in June to 18,461 tons in July. The percentage loss in the daily output of July from June, however, was less than the loss of June from May. The June loss was 17 per cent.

The number of furnaces in operation on Aug. 1 was unchanged from the 46 active on July 1, although the operating rate of the 46 furnaces on Aug. 1 was 17,525 tons, against 18,955 tons on July 1. Five furnaces were placed in operation during July and five were blown out or banked. Of the ones blown in, two belong to the Steel Corporation, two are merchant units and one is an independent steel company stack. Of the furnaces blown out or banked, two are Steel Corporation units, two are independent steel company units and one is a merchant unit.

In the Pittsburgh district the Carnegie Steel Co. blew in a Carrie furnace and the Davison Coal & Coke Co. blew in its Neville Island furnace. The Youngstown Sheet & Tube Co. put on a Hubbard furnace, National Tube Co., one at its Lorain works, and Pickands, Mather & Co., one Toledo furnace. Republic Steel Corpn. took off a Donner furnace and the Trumbull-Cliffs furnace. The Illinois Steel Co. banked two furnaces at its South Chicago works, and the No. 2 City furnace of the Sloss-Sheffield Steel & Iron Co. was blown out or banked.

Production of Coke Pig Iron and Ferromanganese

	Gross Tons Pig Iron*		Ferromanganese†	
	1931	1932	1931	1932
January	1,714,266	972,784	14,251	11,250
February	1,706,621	964,280	19,480	4,010
March	2,032,248	967,235	27,899	4,900
April	2,019,529	852,897	25,456	481
May	1,994,082	783,554	23,959	5,219
June	1,638,627	628,064	11,243	7,702
½ year	11,105,373	5,168,814	122,288	33,562
July	1,163,220	572,296	17,776	2,299
August	1,280,526	.....	12,482	.....
September	1,168,915	.....	14,393	.....
October	1,173,283	.....	14,739	.....
November	1,103,472	.....	14,705	.....
December	980,376	.....	15,732	.....
Year	18,275,165	.....	212,115	.....

*These totals do not include charcoal pig iron. The 1931 production of this iron was 46,213 gross tons.
†Included in pig iron figures.

Daily Average Production of Coke Pig Iron

	Gross Tons 1930	1931	1932
January	91,209	55,299	31,380
February	101,390	60,950	33,251
March	104,715	65,556	31,201
April	106,062	67,317	28,430
May	104,283	64,325	25,276
June	97,804	54,621	20,935
½ year	100,891	61,356	28,412
July	85,146	47,201	18,461
August	81,417	41,308	.....
September	75,890	38,964	.....
October	69,831	37,848	.....
November	62,237	36,782	.....
December	53,732	31,625	.....
Year	86,025	50,069	.....

Merchant Iron Made, Daily Rate

1931	Tons	1931	Tons
Jan.	9,416	Nov.	5,758
Feb.	11,332	Dec.	6,778
March	11,481		
April	13,439	1932	
May	13,212	Jan.	6,256
June	11,209	Feb.	7,251
July	12,012	March	7,157
Aug.	9,569	April	5,287
Sept.	8,985	May	4,658
Oct.	7,051	June	6,090
		July	3,329

Production by Districts and Coke Furnaces in Blast

Furnaces	Production (Gross Tons) July (31 Days)	June (30 Days)	Aug. 1 Number in Blast	Aug. 1 Operating Rate, Tons a Day	July 1 Number in Blast	July 1 Operating Rate, Tons a Day
New York:						
Buffalo	38,974	39,827	2	1,160	3	1,280
Other New York and Mass.	.....	.....	0	.....	0	.....
New Jersey	.....	.....	0	.....	0	.....
Pennsylvania:						
Lehigh Valley*	16,213	16,724	2	525	2	560
Schuylkill Valley	.....	.....	0	.....	0	.....
Susquehanna and Lebanon Valleys	10,050	10,641	1	325	1	355
Ferromanganese	.....	.....	0	.....	0	.....
Pittsburgh District	91,658	86,876	8	3,435	6	2,780
Ferro. and Spiegel	2,299	3,932	1	75	1	135
Shenango Valley	7,817	10,381	1	255	1	350
Western Pa.	6,507	11,481	1	210	1	385
Ferro. and Spiegel	.....	.....	0	.....	0	.....
Maryland	30,939	25,767	2	1,000	2	860
Wheeling District	65,636	82,370	4	2,120	4	2,745
Ohio:						
Mahoning Valley	36,897	14,583	2	650	2	980
Central and Northern	64,189	58,546	6	2,260	4	1,225
Southern	11,980	13,053	2	390	2	405
Illinois and Indiana	137,834	152,108	9	3,400	11	5,070
Mich., Wis. and Minn.	16,797	22,821	1	350	1	320
Colo., Mo. and Utah	8,712	12,255†	1	280	1	280
Virginia	.....	.....	0	.....	0	.....
Kentucky	.....	.....	0	.....	0	.....
Alabama	31,794	36,679	3	1,090	4	1,225
Ferromanganese	.....	.....	0	.....	0	.....
Tennessee	.....	.....	0	.....	0	.....
Total	572,296	628,064	46	17,525	46	18,955

*Includes spiegeleisen.
†Includes ferromanganese.

Reinforcing Steel

Awards 2600 Tons—New Projects 4100 Tons

AWARDS

Boston, 150 tons, pathological building, City Hospital, to Concrete Steel Co.

Brooklyn, N. Y., 575 tons, sewers, to Igoe Brothers, Newark, N. J.

State of New Jersey, 275 tons, widening of route 26 between Trenton and Monmouth Junction, to Igoe Brothers.

Paterson, N. J., 100 tons, post office, to Rawlins Co.

Milan, Mich., 500 tons, State prison, to Jones & Laughlin Steel Corpn.

Chicago, 165 tons, Marine Hospital, to an unnamed bidder.

Buffalo, 300 tons, armory, to Concrete Steel Co.

San Gabriel, Cal., 275 tons, Los Angeles County flood control Dam No. 2, to Los Angeles Iron & Steel Co.

Athena, Ore., 100 tons, grain elevator, to Pacific Coast Steel Co.

San Simeon, Cal., 111 tons, State highway structures, to Truscon Steel Co.

NEW REINFORCING BAR PROJECTS

New York, 300 tons, caisson work for West Side highway; Necaro Co., Inc., Queens, low bidder on general contract.

Thiells, N. Y., 120 tons, State buildings.

Beacon, N. Y., 150 tons, State hospital.

Yonkers, N. Y., 180 tons, sewers.

Cleveland, 100 tons, Glenville Hospital.

Jackson, Miss., 150 tons, post office.

Monroe, La., 150 tons, post office.

State of Wisconsin, 660 tons, grade separation projects; bids close Aug. 9.

Chicago, tonnage being estimated, Musicians' Union Club building.

Duluth, Minn., 300 tons, Medical Arts building.

Oak Park, Ill., 150 tons, post office.

Chicago, 125 tons, South Halsted Street bridge.

Colusa, Cal., 275 tons, Butte Basin Federal flood control weir.

Seattle, 189 tons, State highway viaduct at Aurora and Fiftieth Street; bids close Aug. 23.

State of New Mexico, 179 tons, Otero County Federal highway project.

San Francisco, 750 tons, five west piers for transbay bridge.

Proposals for simplification of metal spools and reels, formulated by a committee of manufacturers, were opposed by a majority of representatives attending a recent conference in New York under auspices of the division of simplified practice, Bureau of Standards. After discussing the proposals under consideration, the conference voted to defer development of a simplified practice recommendation until further notice.

Steel Industry Remains Sanguine, Though Unfavorable Factors Still Linger

Blast Furnace Output Makes New Low Record in July—Ingot Production Off Slightly—Scrap Declines at Pittsburgh

NOTWITHSTANDING such unfavorable factors as a further decline of 11.8 per cent in pig iron production in July, a drop in steel ingot output this week to about 15 per cent, a recession in the price of heavy melting steel scrap at Pittsburgh, a further falling off in automobile production, and the failure of steel and pig iron bookings to show any noticeable change for the better, sentiment in the iron and steel industry remains buoyant.

August is being generally discounted as a month in which little or no change can be expected, and eyes are turned toward September and the fourth quarter. Within the iron and steel industry there are very few developments which can be counted upon as indicating a turn in the tide, and, as a matter of fact, the industry is deriving most of its feeling of hopefulness from influences outside its own immediate sphere, such as the rise in prices of securities, improvement in the credit situation, continued strength in some farm products, and the absence of pessimistic forebodings.

ON the constructive side, so far as the immediate future of the iron and steel industry is concerned, are the gains being made by the oil industry, which have already resulted in a little more liberal buying; the plan mentioned by THE IRON AGE a week ago to induce the railroads to undertake a large program of equipment rehabilitation, which has been given official recognition in a statement issued by President Hoover, and the effort that is being made to hasten the starting of construction work that will be financed by the Reconstruction Finance Corporation. The steel industry well realizes the element of time necessary to the consummation of such plans and therefore does not count upon much in the way of concrete results before September at the earliest.

Though the rate of production in the automobile industry is declining, a condition that is reflected in steel orders, there is a possibility of a fall pick-up as a result of preparation of new models. The retail sales outlook appears to be somewhat more promising because of rising confidence.

Tin plate output has been reduced to less than 40 per cent. Sheet, strip and bar mill units are also running at lower rates, chiefly because of smaller specifications from automobile manufacturers.

July was one of the poorest months on record in structural steel. Total lettings, as compiled by THE IRON AGE, were only 44,200 tons, and inquiries were for no more than 50,000 tons. The past week's total in new contracts was 16,300 tons, including 7800 tons for a section of the West Side elevated highway in New York.

A DECLINE in the steel ingot output rate this week to 15 per cent from 16 per cent, where it has stood for three weeks, is partly attributable to a rather sharp reduction at Chicago, where two blast furnaces also have been put on the inactive list, but other districts likewise are turning out a little less steel than recently, especially the Valleys and Wheeling. Although one fairly large plant in the Pittsburgh district has resumed production after a shutdown, curtailments there have left the rate unchanged.

PIG iron production made another new low record in July, with a total of 572,296 gross tons, against 628,064 tons in June, and a daily average of 18,461 tons, compared with 20,935 tons in June, a decline of 11.4 per cent, which was less, however, than the 17 per cent drop in June from May. The reduced output occurred with no net loss in active furnaces. The number in blast on Aug. 1 was 46, the same as on July 1; five furnaces were blown out and five others were put on. The past month's total was 57 per cent below that of July, 1931.

Not since 1896 has pig iron output been so low. In that year there were four consecutive months in which the daily average fell below 20,000 tons. Iron was being made last month at a yearly total of less than 6,750,000 tons. No full year's output since 1894 has been that low.

ALTHOUGH the general tone of the scrap markets has been better the past two weeks, a decline of 25c. a ton on heavy melting steel at Pittsburgh has resulted from sales to a consumer, bringing down THE IRON AGE composite price to $6.50, following a rise last week to $6.58 as a result of an advance at Chicago. The Pittsburgh market, however, shows none of the pronounced weakness of a month ago, and, in fact, one or two minor grades have advanced there. There is continued strength at Chicago. The composite prices for finished steel and pig iron are unchanged at $13.76 a gross ton and 1.976c. a lb. respectively.

▲ ▲ ▲ A Comparison of Prices ▲ ▲ ▲

Market Prices at Date, and One Week, One Month and One Year Previous, Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

	Aug. 2, 1932	July 26, 1932	July 5, 1932	Aug. 4, 1931
Per Gross Ton:				
No. 2 fdy., Philadelphia	$14.34	$14.34	$14.34	$17.01½
No. 2, Valley furnace	14.50	14.50	14.50	17.00
No. 2 Southern, Cin'ti	13.82	13.82	13.82	14.69
No. 2, Birmingham	11.00	11.00	11.00	12.00
No. 2 foundry, Chicago*	15.50	15.50	15.50	17.50
Basic, del'd eastern Pa.	14.50	14.50	15.50	16.75
Basic, Valley furnace	13.50	13.50	13.50	15.50
Valley Bessemer, del'd P'gh.	16.89	16.89	16.89	18.76
Malleable, Chicago*	15.50	15.50	15.50	17.50
Malleable, Valley	14.50	14.50	14.50	17.00
L. S. charcoal, Chicago	23.17	23.17	23.17	25.01
Ferromanganese, seaboard, carlots	68.00	68.00	68.00	85.00

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Rails, Billets, etc.

Per Gross Ton:				
Rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	32.00	32.00	32.00	34.00
Rerolling billets, Pittsburgh	26.00	26.00	26.00	29.00
Sheet bars, Pittsburgh	26.00	26.00	26.00	29.00
Slabs, Pittsburgh	26.00	26.00	26.00	29.00
Forging billets, Pittsburgh	33.00	33.00	33.00	35.00
Wire rods, Pittsburgh	37.00	37.00	37.00	35.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh. lb.	1.60	1.60	1.60	1.60

Finished Steel

	Cents	Cents	Cents	Cents
Per Lb. to Large Buyers:				
Bars, Pittsburgh	1.60	1.60	1.60	1.60
Bars, Chicago	1.70	1.70	1.70	1.70
Bars, Cleveland	1.65	1.65	1.65	1.65
Bars, New York	1.95	1.95	1.95	1.93
Tank plates, Pittsburgh	1.60	1.60	1.60	1.60
Tank plates, Chicago	1.70	1.70	1.70	1.70
Tank plates, New York	1.898	1.898	1.898	1.88
Structural shapes, Pittsburgh	1.60	1.60	1.60	1.60
Structural shapes, Chicago	1.70	1.70	1.70	1.70
Structural shapes, New York	1.86775	1.86775	1.86775	1.85½
Cold-finished bars, Pittsburgh	1.70	1.70	1.70	2.10
Hot-rolled strips, Pittsburgh	1.45	1.45	1.45	1.55
Cold-rolled strips, Pittsburgh	2.00	2.00	2.00	2.15

Finished Steel

	Aug. 2, 1932	July 26, 1932	July 5, 1932	Aug. 4, 1931
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.20	2.20	2.20	2.40
Hot-rolled annealed sheets, No. 24, Chicago dist. mill	2.30	2.30	2.30	2.50
Sheets, galv., No. 24, P'gh	2.85	2.85	2.85	2.90
Sheets, galv., No. 24, Chicago dist. mill	2.95	2.95	2.95	3.00
Hot-rolled sheets, No. 10, P'gh	1.55	1.55	1.55	1.70
Hot-rolled sheets, No. 10, Chicago dist. mill	1.65	1.65	1.65	1.80
Wire nails, Pittsburgh	1.95	1.95	1.95	1.80
Wire nails, Chicago dist. mill	2.00	2.00	2.00	1.85
Plain wire, Pittsburgh	2.20	2.20	2.20	2.20
Plain wire, Chicago dist. mill	2.25	2.25	2.25	2.25
Barbed wire, galv., P'gh	2.60	2.60	2.60	2.55
Barbed wire, galv., Chicago dist. mill	2.65	2.65	2.65	2.60
Tin plate, 100 lb. box, P'gh	$4.75	$4.75	$4.75	$5.00

Old Material

Per Gross Ton:				
Heavy melting steel, P'gh	$8.00	$8.25	$8.25	$10.75
Heavy melting steel, Phila	6.25	6.25	6.25	8.75
Heavy melting steel, Ch'go	5.25	5.25	4.75	8.75
Carwheels, Chicago	5.50	5.50	5.50	10.00
Carwheels, Philadelphia	8.00	8.00	8.00	12.00
No. 1 cast, Pittsburgh	9.50	9.50	9.00	11.00
No. 1 cast, Philadelphia	8.00	8.00	8.00	11.50
No. 1 cast, Ch'go (net ton)	6.00	6.00	6.00	9.00
No. 1 RR. wrot., Phila.	8.50	8.50	8.50	10.00
No. 1 RR. wrot., Ch'go (net)	3.75	3.75	3.75	7.00

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$2.00	$2.00	$2.00	$2.40
Foundry coke, prompt	3.00	3.00	3.00	3.50

Metals

	Cents	Cents	Cents	Cents
Per Lb. to Large Buyers:				
Lake copper, New York	5.37½	5.37½	5.50	8.12½
Electro'ytic copper, refinery	5.00	5.00	5.12½	7.50
Tin, (Straits), New York	21.75	20.80	20.37½	24.80
Zinc, East St. Louis	2.75	2.50	2.67½	3.85
Zinc, New York	3.42	2.87	3.04½	4.20
Lead, St. Louis	2.85	2.55	2.60½	4.22½
Lead, New York	2.95	2.65	2.75	4.40
Antimony (Asiatic), N. Y.	5.00	5.00	5.00	6.65

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

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▲ ▲ ▲ The Iron Age Composite Prices ▲ ▲ ▲

	Finished Steel	Pig Iron	Steel Scrap
Aug. 2, 1932	1.976c. a Lb.	$13.76 a Gross Ton	$6.50 a Gross Ton
One week ago	1.976c.	13.76	6.58
One month ago	1.976c.	13.76	6.42
One year ago	2.014c.	15.54	9.42
	Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products make 85 per cent of the United States output.	Based on average of basic iror at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1932	1.976c., June 28	1.926c., Feb. 2	$14.81, Jan. 5	$13.76, July 5	$8.50, Jan. 12	$6.42, July 5
1931	2.037c., Jan. 13	1.945c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.317c., April 2	2.273c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.286c., Dec. 11	2.217c., July 17	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 3
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22

Pittsburgh Sentiment is Buoyant Despite Unfavorable Developments

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Sentiment in the Pittsburgh iron and steel trade still buoyant, notwithstanding depressing developments.

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Ingot rate has not risen, though one large plant has resumed production; curtailments elsewhere keep average unchanged.

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Heavy melting steel scrap has declined 25c. a ton on sales into consumption.

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August being discounted as probably a poor month, but upturn is still expected by September.

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PITTSBURGH, Aug. 2.—The local steel industry is having little difficulty in maintaining its recently improved sentiment, notwithstanding rather depressing current developments. Steel ingot production has failed to rise in spite of resumption of production in at least one large plant. Releases of sheets and strip have declined further because of reduced automotive requirements. Tin plate production has fallen under 40 per cent, and structural steel inquiry during July is reported to have been the lightest of the year. The scrap market has declined further on a fairly substantial sale of No. 1 heavy melting steel at $8.

Such developments do not seem to have taken the steel industry by surprise, since August has been generally discounted as a poor month and may equal July's low record in production. Mills are displaying a tendency to postpone rollings whenever possible in order to accumulate business for later in the month, which would make for more economical production costs. In the meantime reports persist that the accumulated needs of many consumers are being held up for late August or early September release, and that the railroads, the oil industry, and even the building trades may contribute substantially to fall betterment. Not much is expected from the automobile industry before October, but lack of buying from this source is expected to be more than offset by the miscellaneous needs of jobbers and other small users of steel.

Steel ingot production in the Pittsburgh district is unchanged at about 15 per cent of capacity. Production has been resumed at one important plant, and another may get under way before the end of the week. Offsetting these developments, an independent unit has gone out of production, and others have curtailed their output. In the Valleys and northern Ohio ingot schedules have failed to rise and probably average less than 15 per cent. One of the large plants in that district has again suspended production indefinitely. Schedules in the Wheeling region are also lower at 25 per cent of capacity. Among finishing mills, tin plate, sheet, strip steel and bar units are running at a lower rate. Other products are generally unchanged.

Prices continue to hold fairly well throughout the entire range of steel products, but weakness persists in some finishes of sheets. Bar prices have been further stabilized by the introduction of a definite set of extras on forging grades.

After displaying considerable strength in the last two weeks, No. 1 heavy melting steel has declined 25c. a ton on the basis of a sale at $8.

Pig Iron

Shipments during July were at about the same rate as in June, and foundries are not yet disposed to place orders. Carload business is generally bringing out the full quoted prices and some makers expect a gain in releases this month. The local merchant furnace has resumed production following several weeks of idleness.

Semi-Finished Steel

Business shows little change, and shipments during July fell a bit under those of June with most producers. The price of billets, slabs and sheet bars is firm at $26 a ton, while forging billets are well maintained in this district at $33. Wire rods are quiet, with the $37, Pittsburgh, price unquestioned.

Rails and Track Accessories

Scarcely any tonnage is being released, but the local rail mill went into operation this week on a tonnage for the Pennsylvania Railroad, which will keep it engaged for about a fortnight.

Bolts, Nuts and Rivets

This industry benefited to some extent from automotive tonnage last month, but the prospect for such business during August is not very good. The other consuming outlets for bolts and nuts are very dull. Prices are holding fairly well.

Bars, Plates and Shapes

Fabricated structural steel lettings last week were the best of the month, and compared favorably with the best similar periods in the year to date. New inquiry made a rather poor showing in the aggregate, as large fabricators were asked to quote on scarcely 50,000 tons in the country as a whole. August promises some improvement, but light inquiry in the preceding month will likely be reflected in August bookings. A viaduct in Pittsburgh will take 400 tons. The Jones & Laughlin Steel Corpn. has booked 5100 tons of sheet steel piling on three Government jobs near Memphis, Tenn. Reinforcing bars are still making a rather disappointing showing. Plates are very quiet, but the prospect of heavy tonnages for car repairs during the fall seems to be good. Demand for merchant bars has tapered off in the last week or two, and movement of alloy steel bars is adversely affected by declining automobile production.

Prices are holding fairly well on all three of the heavy hot-rolled products. Bars are particularly well maintained at 1.60c., Pittsburgh. In line with the policy of steel producers to establish extras commensurate with production costs, bar makers have announced revisions in extras for forging steel. Under the new setup, bars 1-in. square and under are designated as base with extras of $3 and $5 a ton respectively applying on commercial forging and special forging quality. Bars from 1 in. to 1½ in. square take a minimum $3 extra for commercial forging quality, with $5 applying if special forging quality is desired. All bars ½-in. square or larger take the minimum $5 a ton extra for special forging quality.

Tubular Goods

Pipe shipments during July were generally equivalent or slightly less than in the preceding month. One producer reports a slight gain. Oil country good. is still making the best comparative showing, although the current month may bring some curtailment in demand owing to increased suspension of operations in the east Texas fields. Line pipe is still dull, with the inquiry of the Lycoming Natural Gas Co. for 40 miles of 20-in. pipe the only definitely active project before the trade. Standard pipe is ex-

tremely quiet, and lap-weld material is finding scarcely any demand. Movement of mechanical tubing and boiler tubes is steady, but very light.

Wire Products

Buyers of merchant wire products are showing more interest in building up their stocks, but actual specifications have gained very little as yet. Movement of manufacturers' wire is somewhat lighter than it has been. Nails are being taken by jobbers at a fair rate, with improvement reported by some sellers.

Sheets

Declining automobile production has affected the sheet market adversely, as no other major consuming group has increased its needs to offset lighter shipments to the automotive industry. Radio makers are taking slightly heavier shipments, and electric refrigerator business has not entirely dried up. Tack plate is still comparatively active. Production declined further last week, and current schedules are not above 15 per cent of capacity. Prices are steady on most grades of sheet steel, but weakness persists in some finishes.

Tin Plate

Production of tin plate continued to decline last week, and will average less than 40 per cent in the current period. The leading interest is operating at a lower rate than this, and some of the larger independents are down to 25 per cent. Consumers have practically exhausted their stocks, and many of them are demanding very prompt deliveries on small lots. Another upturn in demand might develop in the next 60 days if general business makes a definite turn for the better, but otherwise the tin plate industry has undoubtedly passed its peak for the year.

Strip Steel

Demand is unusually light this week, as shipments to the automobile industry are curtailed considerably. August schedules of these companies are rather indefinite, but indicate a rather sharp falling off from July. Strip demand from other sources is very light and made up entirely of small orders for immediate shipment. Most mills continue to operate one week and suspend the next, and aggregate activity in the industry is not above 15 per cent.

Scrap

Following a brief period of considerable strength, the market on No. 1 heavy melting steel has declined 25c. a ton on the basis of a purchase of 5000 to 10,000 tons at $8. Several dealers shared in the order, even though they admit that it is difficult to pick up scrap for less than $8 at the moment. Occasional cars are available at as low as $7.75, but bids on the Pennsylvania list, closing this week, are reported to be well over the $8 level. Hydraulic bundles were taken by the same buyer at $7.75. Local material can probably be picked up at this level, but no surplus scrap is coming out of Detroit. Another large user of scrap has been expected to place orders for several days, but is still deferring its purchases. The blast furnace grades are stronger on the basis of a sale at $5.50. No changes are reported in the other grades, and the market shows none of the pronounced weakness which prevailed a month ago. The Pennsylvania Railroad list, closing on Aug. 3, contains 20,000 tons, including 2500 tons of No. 1 heavy melting steel.

Coke and Coal

Foundries in this district have shown no disposition to increase their operations, and movement of coke is no better than it has been. Furnace coke continues very dull. The coal market is just as quiet, and lack of Lake cargo tonnage is depressing. Prices are very weak, and subject to rather definite concessions on some grades.

British Producers Continue to Reduce Operations

Holidays and Decreasing Demand Are Depressing Influences—Tin Plate Plants Shut Down for "Stop Week"

LONDON, ENGLAND, Aug. 1 (*By Cable*).—The iron and steel market is under the influence of the holidays and decreasing demand. Producers are faced with the question of how long they can operate at even the present low rate of output. Additional blast furnaces have been blown out.

The Continental market is firmer as a result of the termination of the Belgian coal strike, coal owners having agreed to forego a proposed 5 per cent reduction in wages from July 15. Wages are now stabilized until Nov. 1. Continental steel business is still slack.

Welsh tin plate works are closed for the annual stop week and some will remain idle for a longer period to avoid payments into the pool. Output prior to the suspension was about 50 per cent. The market is firm on steady demand and good shipments.

British prices of galvanized sheets have declined slightly, and Continental prices on billets, bars, shapes and hoops have receded.

The Dominion Alloy Steel Corpn. of Ontario has arranged for importation into Canada of Armco black sheets made in England to be galvanized in Canada. It is expected that about 15,000 tons will be imported.

Meetings of the Continental Wire Rod Cartel and the International Wire Export Co. have taken place at Ostend and dealt with the question of reducing prices of wire in certain foreign markets where outsiders are active.

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton

Ferromanganese, export	£9 0s.	
Billets, open-hearth	4 17 6d	to £5 7s. 6d
Black sheets, Japanese specifications	9 12 6	
Tin plate, per base box	15 3	to 15 6
Steel bars, open-hearth	£7 17½	to £8 7½
Beams, open-hearth	£7 7½	to £7 17½
Channels, open-hearth	£7 12½	to £8 2½
Angles, open-hearth	£7 7½	to £7 17½
Black sheets, No. 24 gage	8 0	to 8 10
Galvanized sheets, No. 24 gage	9 2	to 9 5

Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £ at $4.86

Billets, Thomas	£1 19s.	
Wire rods, No. 5 B.W.G.	4 10	
Black sheets, No. 31 gage, Japanese	11 5	
Steel bars, merchant	2 3	
Beams, Thomas	2 2	
Angles, Thomas, 4-in. and larger	2 2	
Angles, small	2 4	
Hoops and strip steel over 6-in. base	3 2 6d	to £3 5s.
Wire, plain, No. 8	5 7½	
Wire, barbed, 4-pt., No. 10 B.W.G.	8 15	

Produces New Sheet for Porcelain Enameling

The American Rolling Mill Co., Middletown, Ohio, has announced the production of an improved enameling iron to be known as Crystal Etched. The new sheet is made "by a new exclusive process," that uniformly strengthens the adhesion between the enamel and the metal, so that cull and rejection losses will be decreased and there will be greater resistance to chipping and flaking. Reboiling behavior is greatly improved, it is added, and undesirable imperfections, such as black specks, will be markedly reduced. Also with the usual enameling practice, better all-around results will be obtained when this sheet is used.

Besides the fast growing adoption of a porcelain finish for ranges, refrigerators, washing machines and other products widely used in home and industry, the porcelain enameling industry is looking to the building field as a new and important outlet for its products.

Chicago Steel Output Is Lower; Two Blast Furnaces Blown Out

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CHICAGO, Aug. 2.—Demand for finished steel products, as gaged by current purchases and specifications, is practically unchanged, but mill operations are more irregular, with the result that two blast furnaces have been blown out. The South Works closed down last Friday and ingot production has dropped to less than 10 per cent for the district as a whole. Ingots are being taken off the banks at several mills. Shipments represent about 12 per cent of capacity. Only six steel mill blast furnaces of a total of 36 are in blast.

The tank plate market gives appearances of taking on more life, and the miscellaneous use of bars is spreading slowly. Railroad bridge repair work holds promise for some small tonnages. Several Western railroads are increasing the size of track gangs. More private work, in small lots, is reaching reinforcing bar dealers. Structural fabricators sense a slight improvement.

Prices for steel products remain steady except on roofing sheets, where river transportation is a factor. Scrap remains strong. Canadian mills have not been able to break through brokers' ideas of prices. Steel foundry grades are beginning to move in small lots.

Ingot output in the Chicago district has declined to less than 10 per cent. Two blast furnaces at South Works blown out.

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July pig iron shipments the lowest of the year.

* * *

Scrap market remains firm. Advances have occurred on a few grades.

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Pig Iron

July shipments of Northern foundry iron were the lowest so far this year. Current releases show no improvement, but inquiries give sellers the hope that before August ends the movement of iron from furnaces will have gained ground. Two merchant furnaces are in operation, one of them being on intermittently. Alloy specifications, principally from steel foundries, are gaining and August promises to show a decided improvement in this respect.

Bolts, Nuts and Rivets

Demand is dull from practically all sources. Jobbers are taking small lots at rather frequent intervals. July shipments were the lowest in six months and the outlook for August is still very uncertain.

Bars

Releases are lighter in the aggregate, though consumption is somewhat more widespread than at mid-July. Use by automobile manufacturers is declining rather sharply. Further curtailment in use by motor car makers is expected. Movement of farm machinery from warehouses is slowly gaining headway, but the change is not of sufficient magnitude to permit farm equipment builders to make plans for fall production schedules. Local mills are attempting to hold to one extra of $5 for bars of forging quality. They admit that under existing conditions they will be under a disadvantage if they attempt to enter markets to the east of Chicago. Demand for rail steel bars remains spotty. Barn equipment manufacturers are taking small quantities.

Sheets

Unsettlement of prices is noted to the southwest and southeast of Chicago, where river competition is a factor. The keenest competition is in roofing sheets. Prices in and near Chicago are steady, but the movement remains light. Output is about 18 per cent of capacity.

Cold-Rolled Strip

Demand is slowly declining, and production now is about 16 per cent of capacity. Prices are unchanged.

Cast Iron Pipe

Improvement in the bond market and the prospect of aid from Washington for municipalities are encouraging factors. Keen competition for going tonnages is working against stronger prices. Tonnages up for figuring are unusually light.

Wire Products

Reports from farm areas remain favorable, but with farmers busily engaged in the fields there is little actual improvement in the use of steel products. The miscellaneous wants of the manufacturing trade are slightly better, though the aggregate tonnage does not show in production schedules. Sellers look for improved shipments in August. Movement of copper wire products remains slow.

Plates

An oil refinery in the Southwest has ordered tanks calling for 500 tons of plates. Pending work aggregates fully 3500 tons. A utility company that has been figuring for some time on 600 tons of steel pipe is near the point of closing.

Rails and Track Supplies

This market remains extremely dull. The one prospective purchase that may soon develop is that of the Northern Pacific. No rails are being rolled here, and track supply departments are gradually curtailing output.

Structural Material

Awards at 3000 tons and inquiries at 4000 tons reflect a dull market. The one note of encouragement is the fact that a few private tonnages, all small in size, are beginning to come into the market.

Reinforcing Bars

Inquiries, mostly for small tonnages, are more numerous and a larger portion of them are for private work. Public work is also more active and is spread over a wide territory. A new departure from standard grain elevator design is afforded at Calumet, Ill., where new elevators are being built of structural sheet steel rather than of reinforced concrete. Elevators of this size often required 1000 tons of reinforcing bars.

Scrap

This market is holding recent gains and gives evidence of going to higher levels. Heavy melting steel sought here for Canadian mills has not yet been placed. The buyers have raised their bid to $5.50 a ton, delivered at the dock. Brokers also have higher prices in mind and are now naming $6. It is not unlikely that a compromise of $5.75 will be made. About 5000 tons of miscellaneous scrap has been bought for delivery to Peoria. Steel foundries are buying small lots and their inquiries indicate that they will remain in the market. Small quantities of heavy melting scrap are again moving to a Chicago mill.

Philadelphia Trade Still Hopeful Despite Lack of Improvement

PHILADELPHIA, Aug. 2.—The fact that there has been no noticeable improvement in business has not diminished the optimism of the iron and steel trade, which continues to be confident that conditions are shaping for a turn by early September. A significant development, which will have its effect on business enterprise, is a more lenient attitude on the part of the large banks in the matter of commercial loans. This loosening of credit has come about partly as a result of the sharp rise in the security markets and almost coincidentally with the announcement by the Federal reserve banks of the inauguration of a policy of making loans to private individuals and corporations under the terms of the Government act expanding the powers and functions of the Reconstruction Finance Corporation.

Steel ingot output in the eastern Pennsylvania district is unchanged at about 14 per cent of capacity.

Pig Iron

Business in pig iron is still confined to scattered small lots, usually minimum carloads. The nominal quotation for No. 2 foundry iron is $13.50, furnace, but the competition of foreign iron is being met.

Plates, Shapes and Bars

Lettings of structural steel for the Federal Reserve Bank and the Bell Telephone Co. building in Philadelphia are expected this week. With the exception of the Philadelphia post office, on which bids will not be closed until Aug. 26, these are the only important local building jobs pending. A few small jobs, totaling nearly 1000 tons, were awarded in the past week. Demand for plates and bars has not increased. Prices are steady.

Scrap

The better business tone has stopped the decline in scrap prices, but no advances have occurred, largely because of the fact that consumer buying is so small. Scrap brokers will fill carload orders at present quotations, but would ask higher prices for large lots for forward delivery. As soon as the mills come into the market for scrap, substantial advances probably will occur. If it became necessary to reach out as far as New England for scrap, the freight rate alone would be equal to the prices that are being paid locally for some grades.

Imports

Receipts of iron and steel from abroad at Philadelphia last week included 201 tons of pig iron from India, 24 tons of steel bars, 27 tons of steel bands and four tons of structural shapes from France and six tons of shapes from Belgium.

Cincinnati Market Is in Expectant Mood

CINCINNATI, Aug. 2.—Without tangible basis, the market feeling is noticeably improved. Only scattered carload pig iron orders have been booked, but consumers generally appear to be in an expectant mood. Shipments against contracts are holding at steady levels, but melters are still behind contract rates. Here and there inquiry for small quantities of iron from heretofore indifferent users gives rise to hopes for improved business conditions. The stack of the Hamilton Coke & Iron Co., while still in blast, has reduced its production. A small improvement in coke shipments is reported, but new business is absent.

Sheet specifications have improved slightly. Automotive manufacturers have ordered cut material for dies and experimental work on new models. The galvanized sheet demand is better, but not up to expectations. Production is steady at less than 30 per cent of capacity output.

The scrap movement is retarded by price conditions. Dealers' bids are too low to attract material and mills are interested only in "bargain" purchases. Small amounts of scrap are moving on old contracts.

Sizable Steel Awards Feature St. Louis Market

ST. LOUIS, Aug. 2.—Signs this week in the pig iron market are favorable. Shipments of the St. Louis Gas & Coke Corpn. for July were 30 per cent ahead of June. The stove business in the St. Louis district is picking up, shipping specifications being increased and inquiries made for new contracts. Agricultural implement concerns are more optimistic than for some time, and speak of coming into the market in September or October. Spot business shows some improvement, although slight. Melters generally have a better feeling. Prices are firm and unchanged.

Steel

Improvement in the oil business is indicated in the placing of orders for storage tanks, Phillips Petroleum Co. having awarded 1000 tons to the Graver Corpn. and 500 tons to the Kansas City Structural Steel Co. for East St. Louis and Kansas City, respectively, and 550 tons for the Pure Oil Co. to Wyatt Metal & Boiler Co. for Smith's Bluff, Tex. The principal structural award for some time—1000 tons for an approach to the St. Louis Municipal Bridge—went to the Mississippi Valley Structural Steel Co. The importance of Mississippi River work was stressed by the award of 2000 tons of sheet steel piling to Jones & Laughlin Steel Corpn. for a project at Caruthersville, Mo.

Scrap

Reductions of 50c. a ton in machine shop turnings and 75c. a ton in heavy turnings and iron car axles followed purchases by dealers from railroad lists; otherwise the market is unchanged, with little buying by the mills. Railroad lists: Baltimore & Ohio, 3200 tons; Pennsylvania, 19,000 tons.

More Active Pig Iron Demand at Buffalo

BUFFALO, Aug. 2.—The improved sentiment in the pig iron market is even more marked this week. Conviction is growing that a buying movement is definitely on its way. A Worcester, Mass., inquiry for 600 to 700 tons of high-manganese malleable was placed with an Eastern maker. An inquiry from Providence involves 200 tons of foundry. Some of the local makers have been quietly closing in the last week on several inquiries involving 100 tons and slightly better in this district and in the East. The prevailing quotation on Buffalo iron in the East is $14.50, furnace, with little disposition to dip below this figure. Advantage is being taken of the low barge canal rates

Steel

Four furnaces are in operation at the Lackawanna plant of the Bethlehem Steel Corpn. and one furnace is active at the Wickwire Spencer Corpn. Republic's plant is down this week on its alternate week schedule, and the Seneca Iron & Steel Co. is operating 25 per cent.

Scrap

A few sales of stove plate are noted at $6.75 and $7.25. Demand for stove plate and No. 1 machinery cast scrap is improving and this material is now being firmly held at $7 and $9 respectively. With a short supply of this material on hand, dealers are not anxious to contract ahead for other than small tonnages. A very much better feeling prevails. A mill which has been suspending shipments for some time has sent out some small releases on heavy melting steel.

New York Steel Bookings At a Very Low Level

Improvement in Inquiries for Sheets, But No Noticeable Upturn in Orders Has Occurred—Triborough Bridge May Go Ahead

NEW YORK, Aug. 2.—Finished steel bookings in this territory in July were the smallest for any month in the depression for most companies. While sellers share in the more optimistic feeling that has spread over the country, they have not yet noted any actual upturn in their business. In some instances, notably in the case of sheets, there has been an improvement in inquiries, but these have not yet been translated into orders. It would not be surprising to the trade if the New York district should lag considerably behind other sections in business betterment. A very large part of the steel moving into this area goes into construction and it is likely that the building industry will be slow to pick up. It is conceded, however, that some outstanding pending projects may be expedited by R. F. C. loans. Plans are all ready on the Triborough bridge, which is to connect Queens, the Bronx and Manhattan. In fact, the anchors are now in and, with the completion of financial arrangements, work could go ahead rapidly. From 30, 30 to 40,000 tons of steel is involved.

On caissons for the West Side highway, Manhattan, the Necaro Co., Inc., Queens, is low with a bid of $209,948. This work calls for 140 tons of plates and 300 tons of reinforcing steel.

The reinforcing trade stocked up rather heavily with foreign bars prior to the effective date (July 14) of the order requiring the marking of bars with the name of the country of origin. This clearly indicates that the order was necessary to prevent foreign material from being passed as a domestic product.

Pig Iron

A more cheerful tone prevails in this market. However, neither fresh inquiries nor current sales volume offer evidence of definite improvement. Consumer interest is still restricted to small lots, while total bookings of 1500 tons in the past week approximated those in the preceding week and compare with 1000 tons two weeks ago. A Worcester, Mass., melter has closed for part of its 750-ton requirements of special analysis iron. With iron stocks at the idle stacks slowly becoming depleted, foundries are experiencing difficulty in procuring iron of special analysis. Furnaces that are able to produce and ship iron of abnormal specifications are therefore maintaining a firm attitude respecting prices for such demand. The base grades at Buffalo are being fairly well maintained at $14 to $14.25, while eastern Pennsylvania iron is quotable at $13.50 to $14, base furnace. Foreign iron is making little headway in the rather dull market.

Reinforcing Bars

Public works projects continue to comprise the bulk of fresh specifications for bars. Several State buildings at Thiells and Beacon, N. Y., will require about 670 tons, and sewer construction in Yonkers, N. Y., will take 180 tons. Awards of 575 tons for sewers in Brooklyn and 275 tons for road work in New Jersey were made last week to Igoe Brothers, Newark, N. J. Bar mills are adhering rigidly to a base of 1.75c., Pittsburgh, or 2.10c., New York.

Scrap

A further sale of an important tonnage of No. 1 heavy melting steel for export to Japan has been consummated. Accumulation of this material, which is being purchased at $4 a ton on barge, will continue probably until the end of August. Lack of transactions in other grades precludes evidence upon which to base price changes.

Pig Iron Demand in South Still Declining

BIRMINGHAM, Aug. 2.—The trend of pig iron demand is still downward. July sales were extremely light, while July shipments dropped beyond even the low point of June. The immediate outlook is unchanged, although some relief is hoped for within the next 60 days, as a result of Government financing, particularly of public works. Pipe plants are expecting to benefit extensively from R. F. C. loans for public works. Iron shipments remain on a hand-to-mouth basis, with foundry consumption unusually meager. The price of $11 for the Southern market is being firmly maintained, it is stated.

The banking of the Sloss-Sheffield furnace on July 24 left only three active stacks in Alabama. This number will be further reduced within the next week, when Republic Steel blows out its No. 1 furnace, which lately has been on ferromanganese. Republic's No. 2 furnace has been relined and is ready for operations, but it won't be lighted, according to present plans, for about 60 days. Republic is filling its merchant orders from stocks.

Current operations of pipe plants are still irregular. American Cast Iron Pipe Co. is closing both of its plants for the first week of August, but will probably resume the second week. National Cast Iron Pipe Co. is operating one plant instead of two.

Steel

Sheet demand is slow in starting and orders for roofing sheets, which begin to grow at this season, are light. New tonnage still is made up mostly of routine summer requirements. Some improvement was noted last week in tonnage for highway requirements. The July tonnage of both steel manufacturers in this district was close to June figures. Prices are unchanged. Fabricators have had only a small amount of new business during the past several weeks. The Virginia Bridge & Iron Works is low bidder on 450 tons of structural steel for a bridge in Tennessee. Open-hearth operations consist of six units, the same as for the past month.

Scrap

The market is almost at a standstill. Inquiries are few and scattered. There is a small movement on contracts, but new tonnage is negligible.

New England Pig Iron and Scrap Sales Small

BOSTON, Aug. 2.—Owing to the holdup of the purchase of 700 tons by a Massachusetts machinery manufacturer, pig iron sales were again small the past week, aggregating 500 to 600 tons, of which the Mystic Iron Works sold more than 400 tons. Current buying is for prompt or nearby delivery, mostly within a month.

Little or no scrap is moving either to Pennsylvania or New England consuming points. The American Steel & Wire Co., Worcester, has not figured to any extent in recent transactions. New England foundries are consuming more scrap than pig iron, but are buying very largely from yards close to or within trucking distance.

Detroit Scrap Prices Unchanged

DETROIT, Aug. 1.—Prices in the local scrap market remain unchanged, and dullness still prevails. With the undertone of the market strong and prices firming up in outside markets, dealers here anticipate a rise if any buying materializes. Of late prices here have been purely nominal.

Cleveland Trade Experiences No Gain in Steel Orders

Optimism Continues, But Has Not Been Reflected in Business Volume or in Inquiries

CLEVELAND, Aug. 2.—A feeling of optimism continues in the iron and steel producing and consuming industries, but so far this has not been reflected in any gain in orders or inquiries for finished steel. Demand is still confined to small lots for immediate needs. Some manufacturers in metal-working lines report a little improvement in their business outlook, which has resulted from some new inquiries, but their sales have not yet started on the uptrend. While everybody seems hopeful of some business revival soon, it is expected to come very slowly and little, if any, recovery is looked for during August.

Steel ingot output in Cleveland is unchanged for the fourth successive week at 17 per cent of capacity.

With curtailed automobile production this month demands for steel from that source have been reduced to a minimum and are not expected to gain in August. However, several automobile manufacturers are working on new models and are expected to order steel for these in September. No business is coming from railroads in this territory.

Generally, prices are well maintained and there is little pressure for concessions. However, some of the hot-rolled strip manufacturers are not adhering closely to the regular quoted price for small lots, but are taking car lots and in some cases less than car lot orders at 1.45c., which is supposed to be allowed only to large buyers.

Pig Iron

Small-lot inquiry and sales gained slightly during the past week, although the improvement did not extend to the immediate Cleveland territory. One producer took a number of small orders aggregating 1000 tons. Some of the business came from jobbing foundries that were shut down during July and will resume this month. However, the general foundry situation has not improved and some foundries expect to remain closed during August. Quotations are unchanged at $14 to $14.50, Cleveland, for foundry and malleable iron for outside shipment and $15.50 for local delivery.

Bars, Plates and Shapes

Activity in the construction field is being sustained at recent levels by public work, mostly in Federal buildings and highway bridges. There is a fair demand for fabricated work in lots of less than 100 tons. Competition among fabricators is very keen. A Cleveland contractor has placed 500 tons for the Westmoreland-Indiana County highway bridge, Pennsylvania. For a local industrial plant, 125 tons was placed. Demand for merchant and alloy bars remains at a low level. A water main extension in Cleveland will require 200 tons of plates. Prices are maintained at 1.65c., Cleveland, for steel bars and 1.60c., Pittsburgh, for plates and shapes.

Iron Ore

Water shipments of Lake Superior ore during July were 639,884 tons, a slight gain during the last week of the month, making the movement somewhat more than had been expected. Shipments up to Aug. 1 were 1,028,340 tons, a decrease of 90.4 per cent from the same period last year.

Rivets

Small orders and inquiries show a slight improvement. From 400 to 600 tons of special alloy rivets up to 3 in. in diameter will be required for riveting the sections of the overflow pipe of the Hoover Dam provided it is decided to join these sections by riveting instead of welding.

Sheets

Demand is very light from all sources. A slowing down in the motor car industry is being reflected in business for mills that have been sharing in orders from that source. The local Fisher Body plant maintained a fair, although reduced, production of Chevrolet bodies during July and will operate on a three-day schedule this week. Metal furniture manufacturers see little prospect of a better demand for their product until activity in the building field improves. Refrigerator, stove and barrel manufacturers are doing little. Prices are well maintained.

Strip Steel

Orders from the motor car industry have further declined. Operations of leading makers of lamps and other accessories are now very light, and these companies are taking little steel. Concessions have appeared in some cases in that consumers are able to buy less than car lots of hot-rolled strip at 1.45c., Pittsburgh, the base price for large users. While concessions have been reported on cold-rolled strip, the larger producers are adhering to the 2c. price.

Scrap

There is some improvement in the demand for machine shop turnings, which are now being taken by a Warren and two Ohio River consumers. This has resulted in somewhat firmer prices for this grade. A few weeks ago dealers were able to buy some turnings as low as $2, Cleveland, but are now offering $2.50. There is no activity in other grades, and prices are unchanged.

Bethlehem Steel Passes Preferred Dividend

Directors of the Bethlehem Steel Corpn., at their meeting last Thursday, decided to omit the dividend on the preferred stock in view of a deficit for the second quarter of $4,671,266, or almost $1,000,000 larger than the deficit in the first quarter, not counting preferred dividends then paid. The dividend was omitted, President E. G. Grace explained, in order to preserve the corporation's cash position.

During the second quarter the Bethlehem plants operated at an average of 18 per cent, against 23.4 per cent in the preceding quarter and 41.5 during the second quarter of 1931. Last week's operations were at 13 per cent.

Mr. Grace, in commenting on the report and on business conditions, said that he sees a decided change for the better in sentiment, but that this has not yet been reflected in the volume of incoming business. He also said that there is better stabilization of prices than in several months. In answer to a question, he stated that he had heard no talk of a further wage cut in the steel industry.

The total income of the corporation from operations in the June quarter was $271,174, leaving a deficit of $1,434,955 after payment of bond interest. With the further addition of $3,236,311 for depreciation and depletion, the total deficit was $4,671,266. In the first quarter the deficit was $5,330,769, which included $1,645,000 for payment of preferred stock dividends. The volume of business on hand on June 30 was $28,724,004, against $35,372,318 at the end of the previous quarter and $57,334,794 on June 30, 1931.

Other Financia Reports

The Wheeling Steel Corpn., Wheeling, W. Va., in the quarter ended June 30 had net loss after all charges of $686,324, as compared with a loss of $588,205 in the corresponding 1931 quarter. Loss for the first half of 1932 was 1,509,461, as compared with 1,216,828 in the first six months of 1931. Surplus as of June 30, 1932, amounted to $7,429,012.

Earnings in excess of the dividend requirement and more than two and one-quarter times fixed charges were

reported by National Steel Corpn. The company earned $1,153,799 in the six months ended June 30, after all charges and Federal tax. These earnings were equivalent to 53c. a share on 2,156,832 no-par capital shares outstanding and compare with net earnings of $3,459,376 for the corresponding 1931 period. Earnings for the 1931 first half were equivalent to $1.60 a share on the same outstanding capitalization. Earnings for the second quarter of 1932 were $560,999, after all charges and Federal tax, equivalent to 26c. a share, compared with 27c. a share earned in the first quarter and 71c. a share earned in the corresponding 1931 quarter.

The Youngstown Sheet & Tube Co. reported a loss of $3,288,861 for the second quarter, or about $231,000 more than the first quarter deficit. Although the company had a profit on operations of $484,144.61, this was not enough to meet interest charges of $878,253.05.

Inland Steel Co. and subsidiaries report a net loss in the second quarter, after interest, taxes, depreciation and other charges, of $619,982, compared with a deficit of $820,541 in the preceding quarter and a net income of $772,575, equal to 64c. a share, for the second quarter of 1931. Net loss in the first six months of 1932 was $1,440,523.

Railroad Equipment

United States Potash Co. has ordered 12 narrow gage hopper-bottom dump cars from Koppel Industrial Car & Equipment Co.

Chicago Great Western has ordered four gas-electric rail motor cars; the 600 hp. power plants to be furnished by Electro-Motive Co. and bodies and trucks by Pullman Car & Mfg. Corpn.

San Francisco has called for bids on Aug. 5 for 100 tons of Lorain section No. 545 rail for municipal street railway system.

Pacific Fruit Express, through its San Francisco office, is in the market for about 225 tons of refrigerator car underframes.

Cast Iron Pipe

Peabody, Mass., awarded a tonnage of 6- to 12-in. to Warren Foundry & Pipe Corpn.

Lathams Corner, N. Y., opened bids this week on 300 tons of 6- and 8-in.

Northeastern Pipe & Construction Corpn., North Tonawanda, N. Y., has been awarded contract for about 43,000 ft. of underground steam lines to service public buildings in Washington.

Board of District Commissioners, District Building, Washington, asks bids until Aug. 11 for 39,500 ft. of 4- to 20-in.

Nashville, Tenn., has awarded 500 tons of 16-in. to National Cast Iron Pipe Co.

Blaine, Wash., American Cast Iron Pipe Co. is low bidder on 100 tons of 16-in.

Council Bluffs, Iowa, opened bids July 26 on 800 tons of 16-in.

San Rafael, Cal., Army Construction Quartermaster awarded 200 tons for sewer system at Hamilton Field bombing base to National Cast Iron Pipe Co.

Beverly Hills, Cal., will open bids Aug. 16 for 150 to 200 tons of 8-, 10- and 12- or 14-in. class 100 and 150 for new mains in Coldwater Canyon and Doheny Road.

Snohomish, Wash., has applied to Reconstruction Finance Corpn. for a $200,000 loan to replace the city's 21-year-old gravity main.

Fabricated Structural Steel

Lettings Slightly Higher—New Projects Again Decline

THE outstanding award of the week is 7800 tons for a section of the West Side elevated highway in New York. Total bookings were 16,300 tons. New projects at 9300 tons compare with 13,100 tons a week ago; the largest inquiry, 2200 tons, is for an armory in Jamaica, N. Y. Contracts in July called for 44,200 tons compared with 127,800 tons in June and 40,900 tons in May. Awards follow:

NORTH ATLANTIC STATES

Boston 516 tons, pathological building for City Hospital, to Boston Structural Steel Co.

Salem, Mass., 100 tons, post office, to Lackawanna Steel Construction Corpn.

New York, 150 tons, State bridge in Queens, to Lackawanna Steel Construction Corpn.

New York, 7800 tons, section of West Side elevated highway, to American Bridge Co.

Erie Railroad, 350 tons, highway bridge at Owego, N. Y., to American Bridge Co.

Tonawanda, N. Y., 140 tons, shed, to Ernst Iron Works.

Mount Vernon, N. Y., 150 tons, St. Peter's and St. Paul's Church, to American Bridge Co.

Jefferson County, N. Y., 230 tons, New York Central Railroad bridge, to Lackawanna Steel Construction Corpn.

Hillsdale, N. Y., 100 tons, Roeliff Jansen School, to Shippers Car Line Corpn.

State of Pennsylvania, 500 tons, Westmoreland and Indiana County bridge, to McClintic-Marshall Corpn.

Philadelphia, 100 tons, addition to printing plant of Chilton Class Journal Co., Fifty-sixth and Chestnut Streets, to Belmont Iron Works from Ballinger Co., general contractor.

York, Pa., 175 tons, bridge, to Phoenix Bridge Co.

State of Pennsylvania, 320 tons, bridge in Chestnut and Montgomery counties, to McClintic-Marshall Corpn.

Wilmington, Del., 280 tons, Harlan school, to Morris Wheeler & Co.; previously reported to McClintic-Marshall Corpn.

Buena Vista, Md., 200 tons, tuberculosis hospital, to Deitrich Bros.

THE SOUTH

Memphis, Tenn., 5100 tons, sheet steel piling for three Government river projects, to Jones & Laughlin Steel Corpn.

CENTRAL STATES

State of Illinois, 1200 tons, Smith bridge, to Mississippi Valley Structural Steel Co.

Cleveland, 125 tons, factory for Farrand Improvement Co., to Fort Pitt Bridge Works Co.

Tuscarawas County, Ohio, 100 tons, highway bridge, to Burger Iron Co.

Grand Rapids, Mich., 130 tons, purifying boxes, to Western Gas Construction Co.

Chicago, 110 tons, Twelfth Street entrance, World's Fair, to Midland Structural Steel Co.

Carruthersville, Mo., 2000 tons, sheet steel piling for Government river work, to Jones & Laughlin Steel Corpn.

East St. Louis, Ill., 1060 tons, South Valley approach to St. Louis municipal bridge, to Mississippi Valley Structural Steel Co.

State of Iowa, 1000 tons, bridges, to Pittsburgh-Des Moines Steel Co., Des Moines Steel Co. and Clinton Bridge Co.

Sioux City, Iowa, 780 tons, post office and court house, to an unnamed fabricator.

WESTERN STATES

Hoover Dam, Nev., 800 to 1000 tons, towers for cableway for Six Companies, to Consolidated Steel Co.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Lynn, Mass., 220 tons, post office.

Saratoga, N. Y., 900 tons, drink hall; bids asked on revised plans.

New York, 560 tons, foundations for unit of West Side elevated roadway.

Brooklyn, 250 tons, Brighton laundry.

Jamaica, N. Y., 2200 tons, 104th Field Artillery Armory.

Thiells, N. Y., 750 tons, State hospital building.

Onconta, N. Y., 1000 tons, State hospital building.

Baltimore, 250 tons, freight distributing station.

Pittsburgh, 400 tons, viaduct No. 1 on Mount Washington roadway.

State of Pennsylvania, 450 tons, highway bridge.

THE SOUTH

Knox County, Tenn., 450 tons, highway bridge; Virginia Bridge & Iron Co. low bidder.

Lexington, Ky., 600 tons, post office.

CENTRAL STATES

State of Wisconsin, 415 tons, grade separation projects; bids close Aug. 9.

Calumet, Ill., 175 tons, grain elevator; James Stuart, general contractor.

Oak Park, Ill., 650 tons, post office.

Dubuque, Iowa, 300 tons, post office, Ideal Construction Co., Gary, Ind., low bidder.

Mandan, N. D., 250 tons, State highway bridge.

Clearing, Ill., 100 tons, building for Visking Corpn.

WESTERN STATES

San Gabriel, Cal., 280 tons, structures for Los Angeles County flood control dam.

Pasadena, Cal., 200 tons, gate structures for Pine Canyon dam, Consolidated Steel Co. low bidder.

Casitas, Cal., 150 tons, pier for submarine oil wells.

Livingston, Cal., 525 tons, State Highway bridge.

FABRICATED PLATE

AWARDS

Lawrenceburg, Ind., 135 tons, alcohol tanks, to Birmingham Tank & Boiler Co.

Youngstown, 1282 tons, tank and standpipe, to Chicago Bridge & Iron Co.

Milwaukee, 600 tons, steel water tank for city of Milwaukee, to A. O. Smith Corpn.

East St. Louis, Ill., 1000 tons, storage tanks for Phillips Petroleum Co., to Graver Corpn.; previously reported as St. Louis, to an unnamed fabricator.

Kansas City, Mo., 500 tons, storage tank for Phillips Petroleum Co., to Kansas City Structural Steel Co.

Smith's Bluff, Tex., 550 tons, storage tanks for Pure Oil Co., to Wyatt Metal & Boiler Co.

El Reno, Okla., 105 tons, elevated tank, to Chicago Bridge & Iron Co.

NEW PROJECTS

New York, 140 tons, caisson work for West Side highway; Necaro Co., Inc., Queens, low bidder on general contract.

Cleveland, 200 tons, 2000 ft. 48-in. and 54-in. pipe for water mains.

Copper Strengthening Here and Abroad; Firmness Extends to Other Metals

NEW YORK, Aug. 2.—The optimism that has permeated general business sentiment has apparently spread to the copper trade. Evidences of the improved outlook are reflected in a broader consumer interest and more frequent sales, both here and abroad. As a result of the better demand, prices have assumed a stronger tone. Little pressure is being exerted to sell electrolytic metal at the current price of 5.25c., delivered Connecticut. In fact, a large custom smelter, which has had no difficulty in disposing of its daily intake, has boosted its quotation to 5.37½c., delivered. Foreign prices have also been bolstered by a decided improvement in demand. Following offerings early last week at as low as 4.45c., c.i.f. usual European ports, foreign prices rose gradually throughout the week and now range from 4.80c. to 4.90c. A fair amount of sales at these prices was reported in the foreign markets this morning. Lake copper is dormant and unchanged at 5.37½c., delivered.

Copper Averages

The average price of Lake copper for July, based on daily quotations in THE IRON AGE, was 5.42c. The average price of electrolytic copper in that month was 5.04½c., refinery, or 5.25½c., delivered Connecticut.

Tin

Buying of tin in both the New York and London markets last week reached relatively substantial proportions. Interest in future tin, which has been apathetic for some time, is fairly brisk, and several buyers have covered for delivery through January. The New York price of tin today was 21.75c., the highest level since early in May. The London market also advanced sharply in the past week, with today's prices £133 a ton for spot standard, £134 15s. for future standard and £138 5s. for spot Straits. The Singapore market today was £137 17s. 6d. American deliveries of tin in July were 2200 tons at Atlantic ports and 65 tons at Pacific ports. The world's visible supply of tin decreased 370 tons last month, but with an increase of 1982 tons in carryovers in the East the visible supply actually increased 1612 tons. United Kingdom warehouse stocks decreased 43 tons in the past week to a total of 33,022 tons.

Lead

Buying for prompt and August delivery in the past week was fairly active. With practically 80 per cent of consumer needs covered for next month, however, interest has subsided somewhat. A leading smelter has opened its books for September business, but buying for that month has not yet gained momentum. The current price of 2.95c., New York, and 2.85c., St. Louis, is apparently well established.

Zinc

A notable improvement in demand late last week resulted in advances in price, which are now posted at 3.12c., New York, and 2.75c., East St. Louis. Total sales in the past week reached 4800 tons, the largest volume reported for some time. The Joplin ore market reflects a steady position, with prices firm at $14 to $15. Ore production last week amounted to 950 tons, while sales totaled about 1200 tons.

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The Week's Prices. Cents Per Pound for Early Delivery

	July 27	July 28	July 29	July 30	Aug. 1	Aug. 2
Lake copper, New York	5.37½	5.37½	5.37½	5.37½	5.37½	5.37½
Electrolytic copper, N. Y.*	5.00	5.00	5.00	5.00	5.00	5.00
Straits tin, spot, N. Y.	21.05	21.20	21.37½	....	21.50	21.75
Zinc, East St. Louis	2.50	2.50	2.50	2.50	2.60	2.75
Zinc, New York	2.87	2.87	2.87	2.87	2.97	3.12
Lead, St. Louis	2.70	2.85	2.85	2.85	2.85	2.85
Lead, New York	2.80	2.95	2.95	2.95	2.95	2.95

*Refinery quotation; price ½c. higher delivered in the Connecticut Valley.
Aluminum, 98 to 99 per cent pure, 22.50c. a lb. delivered.
Nickel, electrolytic cathode, 35c. a lb. delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 5.00c. a lb., New York.
Brass ingots, 85-5-5-5, 5.75c. a lb., New York and Philadelphia.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits, pig	23.50c. to 24.50c.
Tin, bar	25.50c. to 27.50c.
Copper, Lake	7.50c. to 8.50c.
Copper, electrolytic	7.25c. to 8.25c.
Copper, casting	7.00c. to 8.00c.
*Copper sheets, hot-rolled	14.87½c.
*High brass sheets	12.00c.
*Seamless brass tubes	15.25c.
*Seamless copper tubes	14.37½c.
*Brass rods	9.75c.
Zinc, slabs	4.25c. to 4.75c.
Zinc sheets (No. 9), casks	9.25c. to 9.50c.
Lead, American pig	3.75c. to 4.25c.
Lead, bar	5.50c. to 6.50c.
Lead sheets	7.25c.
Antimony, Asiatic	8.00c. to 9.00c.
Alum., virgin, 99 per cent plus	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	16.00c.
Solder, ½ and ½*	15.25c. to 16.25c.
Babbitt metal, commercial grade	18.00c. to 28.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

Metals from Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	25.00c.
Tin, bar	27.00c.
Copper, Lake	6.50c.
Copper, electrolytic	6.50c.
Copper, casting	6.25c.
Zinc, slab	4.25c. to 4.50c.
Lead, American pig	3.50c. to 3.75c.
Lead, bar	6.75c.
Antimony, Asiatic	9.00c.
Babbitt metal, medium grade	15.00c.
Babbitt metal, high grade	29.25c.
Solder, ½ and ½	16.25c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	3.75c.	4.25c.
Copper, hvy. and wire	3.50c.	4.125c.
Copper, light and bottoms	2.75c.	3.125c.
Brass, heavy	1.625c.	2.125c.
Brass, light	1.25c.	1.75c.
Hvy. machine composition	2.50c.	3.125c.
No. 1 yel. brass turnings	1.875c.	2.25c.
No. 1 red brass or compos. turnings	2.25c.	2.875c.
Lead, heavy	1.75c.	2.25c.
Zinc	1.00c.	1.25c.
Cast aluminum	2.50c.	4.00c.
Sheet aluminum	6.50c.	8.00c.

Pipe Lines

Natural Gas Pipe Line Co. of America, Inc., 20 North Wacker Drive, Chicago, is planning 8-in. natural gas pipe line in several counties in Iowa, from Evans to Waterloo, Iowa.

Peninsular Construction Co., Detroit, care of Thomas E. Currie, 909 Transportation Building, president, recently organized by Mr. Currie and associates with capital of $500,000, has begun surveys for a 20-in. natural gas pipe line from gas fields near Mount Pleasant, Mich., to point near Detroit, about 160 miles, including proposed field connecting lines. Company has applied to City Council, Hamtramck, Mich., for permission for line in that district, with local distributing system for commercial service.

Southwestern Gas & Electric Co., Shreveport, La., has let contract to L. E. Myers Co., Allen Building, Dallas, Tex., for 6-in. pipe line at Biloxi, Miss., for service in outlying districts. Cost about $35,000.

Metropolitan Water District, Hartford, Conn., has awarded a round tonnage of 21-in. steel pipe to Walsh Holyoke Steam Boiler Works, Holyoke, Mass.

"Products of Manufacturing Industries, 1929," which has been published by the Bureau of the Census, presents a detailed compilation of production, in quantity and value, of commodities as classified by the Census of Manufactures. This publication is particularly adaptable as an aid in market analyses. Copies may be purchased from Superintendent of Documents, Government Printing Office, Washington, for 15c. each.

Prices of Finished and Semi-Finished Steel, Coke, Coal, Cast Iron Pipe

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
Del'd Philadelphia	1.91c.
Del'd New York	1.95c.
Del'd Detroit	1.80c.
F.o.b. Cleveland	1.65c.
F.o.b. Lackawanna	1.70c.
F.o.b. Birmingham	1.75c.
C.l.f. Pacific ports	2.10c.

Billet Steel Reinforcing
(as quoted by distributers)

F.o.b. P'gh mills, 40, 50, 60-ft.	1.60c.
F.o.b. Birmingham, mill lengths	1.75c.
F.o.b. Cleveland	1.60c. to 1.75c.

Rail Steel

F.o.b. mills, east of Chicago dist	1.35c. to 1.45c.
F.o.b. Chicago Heights mills	1.50c.

Iron

Common iron, f.o.b. Chicago	1.65c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.11c.
Common iron, del'd New York	2.15c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
F.o.b. Birmingham	1.75c.
F.o.b. Lackawanna	1.70c.
F.o.b. Bethlehem	1.70c.
Del'd Cleveland	1.8035c.
Del'd Philadelphia	1.7495c.
Del'd New York	1.8677 5c.
C.l.f. Pacific ports (standard)	2.10c.
C.l.f. Pacific ports (wide flange)	2.20c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
F.o.b. Birmingham	1.75c.
F.o.b. Lackawanna	1.70c.
F.o.b. Bethlehem	1.70c.
Del'd Cleveland	1.8035c.
Del'd Philadelphia	1.7495c.
Del'd New York	1.8677 5c.
C.l.f. Pacific ports (standard)	2.10c.
C.l.f. Pacific ports (wide flange)	2.20c.

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	1.90c.
F.o.b. Chicago mill	2.05c.
F.o.b. Buffalo	2.00c.

Alloy Steel Bars

(F.o.b. maker's mill)

Alloy Quantity Bar Base, 2.45c. to 2.65c. per Lb.

S.A.E. Series Numbers	Alloy Differential per 100 Lb.
2000 (1% Nickel)	$0.25
2100 (1½% Nickel)	0.55
2300 (3½% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.16 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
6100 Chromium Spring Steel	0.20
6100 Chromium Vanadium Bar	1.20
6100 Chromium Vanadium Spring Steel	0.95
9250 Silicon Manganese Spring Steel (flats)	0.25
Rounds and Squares	0.50
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

Above prices are for hot-rolled steel bars, forging quality. The differential for cold-drawn bars is ¾c. a lb. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a section area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2½ in. thick, regardless of sectional area, take the bar price.

Cold Finished Bars*

	Base per Lb.
Bars, f.o.b. Pittsburgh mill	1.70c.
Bars, f.o.b. Chicago	1.75c.
Bars, Cleveland	1.75c.
Bars, Buffalo	1.75c.
Bars, Detroit	1.90c.
Bars, eastern Michigan	1.95c.
Shafting, ground, f.o.b. mill	†2.05c to 3.00c.

*In quantities of 10,000 lb. or more.
†According to size.

SHEETS, STRIP, TIN PLATE, TERNE PLATE

Sheets

Hot-rolled

	Base per Lb.
No. 10 f.o.b. Pittsburgh	1.55c.
No. 10 f.o.b. Chicago mill	1.65c.
No. 10 del'd Philadelphia	1.86c.
No. 10 f.o.b. Birmingham	1.70c.
No. 10, c.l.f. Pacific Coast ports	2.17½c.

Hot-rolled and Annealed

No. 10, Pittsburgh	1.70c.
No. 10, Chicago mills	1.80c.
No. 10, Birmingham	1.85c.
No. 10, Pacific Coast ports	2.32½c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.20c.
No. 24, f.o.b. Chicago mills	2.30c.
No. 24, del'd Philadelphia	2.46c. to 2.51c.
No. 24, f.o.b. Birmingham	2.35c.
No. 24, c.l.f. Pacific Coast ports	2.85c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	2.25c.
No. 10 gage, f.o.b. Chicago mills	2.35c.
No. 10 gage, del'd Philadelphia	2.46c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.75c.
No. 20 gage, f.o.b. Chicago mills	2.85c.
No. 20 gage, del'd Philadelphia	3.06c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	2.85c. to 2.90c.

Steel Furniture Sheets

No. 10, f.o.b. Pittsburgh	2.65c.
No. 20, f.o.b. Pittsburgh	3.15c.

(Prices on furniture stock include stretcher leveling but not resquaring.)

Galvanized Sheets

No. 24, f.o.b. Pittsburgh	2.85c.
No. 24, f.o.b. Chicago mills	2.95c.
No. 24, del'd Philadelphia	3.16c.
No. 24, f.o.b. Birmingham	3.00c.
No. 24, c.l.f. Pacific Coast ports	3.50c.

Long Ternes

No. 24, unassorted, 8-lb. coating, f.o.b. P'gh	2.80c. to 3.00c.

Vitreous Enameling Stock

No. 10, f.o.b. Pittsburgh	2.50c. to 2.60c.
No. 20, f.o.b. Pittsburgh	3.00c. to 3.10c.

Tin Mill Black Plate

No. 28 f.o.b. Pittsburgh	2.40c.
No. 28 Chicago mill	2.50c.

Tin Plate

	Base per Box
Standard cokes, f.o.b. P'gh district mill	$4.75
Standard cokes, f.o.b. Gary	4.85

Terne Plate

(F.o.b. Morgantown or Pittsburgh)
(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$9.50
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.10
30-lb. coating I.C.	14.90
40-lb. coating I.C.	16.70

Hot-rolled Hoops, Bands and Strips

	Base per Lb
All widths up to 24 in., Pittsburgh	1.45c to 1.50c
All widths up to 24 in., Chicago	1.55c. to 1.60c.
Cooperage stock, P'gh	1.55c. to 1.60c.
Cooperage stock, Chicago	1.65c. to 1.70c.

Cold-Rolled Strips

F.o.b. Pittsburgh	2.00c.
F.o.b. Cleveland	2.00c.
Del'd Chicago	2.30c.
F.o.b. Worcester	2.20c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland	2.90c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland)

(After Dec. 31, extras of 10c. a 100 lb. on mixed and joint carloads, 25c on pool carloads and 40c. on less than carloads will be applied on all merchant wire products.)

To Manufacturing Trade

Bright wire	2.20c.
Spring wire	3.20c.

To Jobbing Trade

	Base per Keg
Standard wire nails	$1.95
Smooth coated nails	1.95
Galvanized nails	3.95

	Base per Lb.
Smooth annealed wire	2.35c.
Smooth galvanized wire	2.80c.
Polished staples	2.50c.
Galvanized staples	2.75c.
Barbed wire, galvanized	2.60c.
Woven wire fence, No. 9 gage, per net ton	$55.00
Woven wire fence, No. 12½ gage and lighter, per net ton	60.00

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base; Duluth, Minn., and Worcester, Mass., mill $2 a ton over Pittsburgh, and Birmingham mill $3 a ton over Pittsburgh.

STEEL PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv
⅛	47	21½	⅛ and ¼	+9	+34
⅜ to ⅝	53	27½	½	25	7
½	58	44½	¾	30	13
¾	62	50½	1 and 1¼	33	17
1 to 3	64	52½	1½ and 2	37	20

Lap Weld

2	57	45½	2	25	11
2½ to 6	61	49½	2½ to 3½	30	15
7 and 8	58	45½	4 to 6	32	19
9 and 10	56	43½	7 and 8	31	18
11 and 12	55	42½	9 to 12	28	13

Butt Weld, extra strong, plain ends

⅛	43	26½	¼ and ⅜	+11	+46
¼ to ⅝	49	32½	½	25	9
½	55	44½	¾	30	14
¾	60	49½	1 to 2	36	20
1 to 1¼	62	51½			
2 to 3	63	52½			

Lap Weld, extra strong, plain ends

2	55	44½	2	31	15
2½ to 4	59	48½	2½ to 4	36	22
4½ to 6	58	47½	4½ to 6	35	21
7 to 8	54	41½	7 and 8	33	19
9 and 10	47	34½	9 to 12	23	10
11 and 12	46	33½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discounts of 5 and 2½% and on galvanized by 1½ points with supplementary discounts of 5 and 2½%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		Charcoal Iron	
2 in. and 2¼ in.	38	1½ in.	1
2½ in.—2¾ in.	46	1¾ in.	8
3 in.	52	2 in.—2¼ in.	13
3¼ in.—3¾ in.	54	2½ in.—2¾ in.	16
4 in.	57	3 in.	17
4½ in. to 6 in.	46	3½ in. to 3½ in.	18
		4 in.	20
		4½ in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold-Drawn

1 in.	41	3 in.	46
1¼ to 1½ in.	53	3½ to 3½ in.	48
1⅝ in.	37	4 in.	51
2 to 2¼ in.	32	4½, 5 and 6 in.	40
2½ to 2¾ in.	40		

Hot Rolled

2 and 2¼ in.	38	3¼ to 3½ in.	54
2½ and 2¾ in.	46	4 in.	57
3 in.	52	4½, 5 and 6 in.	46

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb., base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. in lighter than standard gages takes the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30% base (carloads)	55
Carbon, 0.30% to 40% base	50

Plus differential for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

RAILS AND TRACK SUPPLIES

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	32.00
Light (from rail steel, f.o.b. mill)	$28.00 to 30.00

Track Equipment

	Base per 100 Lb.
Spikes, 9/16-in. and larger	$2.60
Spikes, ½-in. and larger	2.60
Spikes, boat and barge	2.80
Tie plate, steel	1.85
Angle bars	2.75
Track bolts, to steam railroads	3.50
Track bolts, to jobbers, all sizes, per 100 count	73 per cent off list

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	75
†Carriage bolts	75
Lag bolts	75
Plow bolts, Nos. 1, 2, 3 and 7 heads	75
Hot-pressed nuts, blank or tapped, square	75
Hot-pressed nuts, blank or tapped, hexagons	75
C.p.c. and t. square or hex. nuts, blank or tapped	75
Washers*	7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.
†Bolts with rolled thread up to and including ⅝ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	75
Semi-finished hexagon castellated nuts, S.A.E.	75
Stove bolts in packages, P'gh	77½, 25 and 10
Stove bolts in packages, Chicago	77½, 25 and 10
Stove bolts in pkgs., Cleveland	77½, 25 and 10
Stove bolts in bulk, P'gh	86
Stove bolts in bulk, Chicago	86
Stove bolts in bulk, Cleveland	86
Tire bolts	60 and 10

Discount of 75 per cent off on bolts and nuts applies on carload business with jobbers and large consumers.

Large Rivets

(½-in. and larger)

	Base per Lb
F.o.b. Pittsburgh or Cleveland	$2.25
F.o.b. Chicago	70, 10 and 5

Small Rivets

(7/16-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5
F.o.b. Chicago	70, 10 and 5

Cap and Set Screws

Discounts to Jobbers

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws, 1 in. dia. and smaller	80 and 25
Milled standard set screws, case hardened, 1 in dia. and smaller	75 and 10
Milled headless set screws, cut thread, ¾ in. and smaller	75 and 10
Upset hex. head cap screws, U.S.S.S. or S.A.E. thread, 1 in. dia. and smaller	80, 25 and 10
Upset set screws, sq. head, 1 in. dia. and smaller	75, 10 and 10
Upset set screws, 1⅛ in. and larger	75 and 10
Milled studs	70

SEMI-FINISHED STEEL

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and under 10-in., Pittsburgh	$26.00
Rerolling, 4-in. and under 10-in., Youngstown	26.00
Rerolling, 4-in. and under 10-in., Cleveland	26.00
Rerolling, 4-in. and under 10-in., Chicago	29.00
Forging quality, Pittsburgh	33.00
Forging quality, Youngstown	33.00

Sheet Bars

(Open-Hearth or Bessemer)

	Per Gross Ton
Pittsburgh	$26.00
Youngstown	26.00
Cleveland	26.00

Slabs

(8 in. x 2 in. and under 10 in. x 10 in.)

	Per Gross Ton
Pittsburgh	$26.00
Youngstown	26.00
Cleveland	26.00

(Turn to next page)

(F.o.b. Pittsburgh or Youngstown)

	Per Lb.
Grooved	1.60c.
Universal	1.60c.
Sheared	1.60c.

Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	$37.00
Cleveland	37.00
Chicago	38.00

COKE, COAL AND FUEL OIL

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.00 to $2.15
Foundry, f.o.b. Connellsville prompt	3.00 to 4.25
Foundry, by-product, Chicago ovens, for delivery outside switching districts	7.00
Foundry, by-product, delivered in Chicago switching district	7.75
Foundry, by-product, New England, delivered	10.00
Foundry, by-product, Newark or Jersey City, del'd	8.20 to 8.81
Foundry, by-product, Phila.	9.00
Foundry, by-product, Cleveland, delivered	7.82
Foundry, Birmingham	5.00
Foundry, by-products, St. Louis, f.o.b., ovens	8.00
Foundry, by-products, del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.20 to $1.30
Mine run coking coal, f.o.b. W. Pa.	1.20 to 1.30
Gas coal, ¾-in., f.o.b. Pa. mines	1.20 to 1.30
Mine run gas coal, f.o.b. Pa. mines	1.20 to 1.30
Steam slack, f.o.b. W. Pa. mines	0.50 to 0.65
Gas slack, f.o.b. W. Pa. mines	0.50 to 0.65

Fuel Oil

Per Gal. f.o.b. Bayonne, N. J.

No. 3 distillate	4.00c.
No. 4 industrial	3.50c.

Per Gal. f.o.b. Baltimore

No. 3 distillate	4.00c.
No. 4 industrial	3.50c.

Per Gal. del'd Chicago

No. 3 industrial fuel oil	2.65c.
No. 5 industrial fuel oil	2.45c.

Per Gal. f.o.b. Cleveland

No. 3 industrial fuel oil	4.02½c.
No. 4 distillate	4.00c.

REFRACTORIES

Fire Clay Brick

	Per 1000 f.o.b. Works: High-heat Duty Brick	Intermediate Duty Brick
Penn.	$35.00	$25.00 to $30.00
Maryland	35.00	25.00 to 30.00
New Jer.	$33.00 to 57.00	
Ohio	35.00	25.00 to 30.00
Kentucky	35.00	25.00 to 30.00
Missouri	35.00	30.00
Illinois	35.00	25.00 to 30.00
Ground fire clay, per ton	6.50	

Chrome Brick

	Per Net Ton
Standard size	$42.50

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$38.00
Chicago	47.00
Birmingham	50.00
Silica clay, per ton	8.00

Magnesite Brick

	Per Net Ton
Standard sizes, burned, f.o.b. Baltimore and Chester, Pa.	$61.50
Unburned, f.o.b. Baltimore	52.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	38.50
Domestic, f.o.b. Chewelah, Wash.	20.00

CAST IRON PIPE

	Per Net Ton
6-in. and larger, del'd Chicago	$34.40 to $38.40
4-in., del'd Chicago	37.40 to 41.40
6-in. and larger, del'd New York	30.30
4-in., del'd New York	33.30
6-in. and larger, Birm'ham	$32.00 to 33.00
4-in., Birmingham	35.00 to 36.00

Class "A" and gas pipe, $3 extra.

Pig Iron, Ores, Ferroalloys

VALLEY

Per gross ton, f.o.b. Valley furnace:

Basic	$13.50
Bessemer	15.00
Gray forge	14.50
No. 2 foundry	14.50
No. 3 foundry	14.00
Malleable	$14.50 to 15.00
Low phos., copper free	25.00

Freight rate to Pittsburgh or Cleveland district, $1.89.

PITTSBURGH

Per gross ton, f.o.b. Pittsburgh district furnace:

Basic	$14.00
No. 2 foundry	15.00
No. 3 foundry	14.50
Malleable	15.00
Bessemer	15.00

Freight rates to points in Pittsburgh district range from 69c. to $1.26.

CHICAGO

Per gross ton at Chicago furnace:

N'th'n No. 2 fdy.	$15.50
N'th'n No. 1 fdy.	16.00
Malleable, not over 2.25 sil.	15.50
High phosphorus	15.50
Lake Super. charcoal, sil. 1.50, by rail	23.17
Southern No. 2 fdy.	16.14
Low phos., sil. 1 to 2, Copper free	27.50
Silvery, sil. 8 per cent	23.67
Bess. ferrosil'n, 15 per cent	28.92

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnaces, not including a switching charge.

ST. LOUIS

Per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	$17.50
Malleable, f.o.b. Granite City	17.50
Northern No. 2 fdy., del'd St. Louis	$18.30 to 18.80
Southern No. 2 fdy. del'd.	14.56
Northern malleable, del'd.	18.30 to 18.80
Northern basic, deliv'd.	18.30 to 18.80

Freight rates 83c. (average) Granite City to St. Louis; $2.30 from Chicago; $4.56 from Birmingham.

NEW YORK

Per gross ton, delivered New York district:

*Buffalo, No. 2, del'd east N. J.	$17.41 to $17.66
East Pa. No. 2 fdy.	15.02 to 15.52
East Pa. No. 2X fdy.	15.52 to 16.02

Freight rates: $1.52 to $2.63 from eastern Pennsylvania.

*Prices delivered to New Jersey cities having rate of $3.41 a ton from Buffalo.

BUFFALO

Per gross ton, f.o.b. furnace:

No. 2 fdy.	$16.00
No. 2X fdy.	16.50
No. 1 fdy.	17.50
Malleable, sil. up to 2.25	16.50
Basic	15.50
Lake Superior charcoal, del'd	23.41

NEW ENGLAND

Per gross ton delivered to most New England points:

*Buffalo, sil. 1.75 to 2.25	$19.04 to $20.04
*Buffalo, sil. 2.25 to 2.75	19.04 to 20.04
†Buffalo, sil. 1.75 to 2.25	17.41 to 18.91
†Buffalo, sil. 2.25 to 2.75	17.41 to 18.91
*Ala., sil. 1.75 to 2.25	19.74
*Ala., sil. 2.25 to 2.75	20.24
†Ala., sil. 1.75 to 2.25	15.88
†Ala., sil. 2.25 to 2.75	16.28

Freight rates: $5.05 all rail from Buffalo, and $3.41 to $3.91 rail and water from Buffalo when $1 barge and $2 to $2.50 New England freight rate are obtainable; $9.75 all rail from Alabama and $5.88 rail and water from Alabama to New England seaboard.

*All-rail rate.

†Rail-and-water rate.

CINCINNATI

Per gross ton, delivered Cincinnati:

Ala. fdy., sil. 1.75 to 2.25	$13.82
Ala. fdy., sil. 2.25 to 2.75	14.32
Tenn. fdy., sil. 1.75 to 2.25	13.82
N'th'n No. 2 foundry	$17.01 to 17.59
S'th'n Ohio silvery, 8%	21.02

Freight rates, $2.02 from Ironton and Jackson, Ohio; $3.82 from Birmingham.

PHILADELPHIA

Per gross ton at Philadelphia:

East. Pa. No. 2	$14.34 to $14.84
East. Pa. No. 2X	14.84 to 15.34
East. Pa. No. 1X	15.34 to 15.84
Basic (del'd east. Pa.)	14.50 to 15.00
Malleable	17.50 to 18.00
Stand. low phos. (f.o.b. east. Pa. furnace)	20.50 to 21.50
Cop. b'r'g low phos. (f.o.b. furnace)	20.50 to 21.50
Va. No. 2 plain	21.54 to 22.04
Va. No. 2X	22.04 to 22.54

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 83c. to $1.79 from eastern Pennsylvania furnaces; $4.67 from Virginia furnaces.

CLEVELAND

Per gross ton at Cleveland furnace:

N'th'n No. 2 fdy. (local delivery)	$15.50
S'th'n fdy. sil. 1.75 to 2.25	16.14
Malleable (local delivery)	15.50
Ohio silvery, 8 per cent	21.87
Stand. low. phos., Valley	23.00

Prices are f.o.b. furnace except on Southern foundry and silvery iron. Freight rates: 55c. average local switching charge; $3.12 from Jackson, Ohio; $6.14 from Birmingham.

BIRMINGHAM

Per gross ton, f.o.b. Birmingham dist. furnace:

No. 2 fdy., 1.75 to 2.25 sil.	$11.00
No. 2 soft, 2.25 to 2.75 sil.	11.50
Basic	11.00

CANADA

Per gross ton:

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	$22.60
No. 2 fdy., sil. 1.75 to 2.25	22.10
Malleable	22.60

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$24.00
No. 2 fdy., sil. 1.75 to 2.25	23.50
Malleable	24.00
Basic	$23.00 to $23.50

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard	$68.00
Foreign, 80%, Atlantic or Gulf port, duty paid	68.00

Prices for lots of one carload or more; extras applied on less than carload lots.

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$25.00

Electric Ferrosilicon

Per Gross Ton Delivered

50% (carloads)	$77.50
50% (less carloads)	85.00
75% (carloads)	126.00
75% (less carloads)	136.00
14% to 16% (f.o.b.) Ont., in carloads	Welland, 31.00
14% to 16% (less carloads)	36.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		Per Gross Ton	
10%	$20.50	14%	$23.50
11%	21.00	15%	24.00
12%	21.50	16%	25.00
13%	22.50	17%	26.50

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		Per Gross Ton	
6%	$18.00	12%	$20.50
7%	18.50	13%	21.50
8%	18.75	14%	22.50
9%	19.00	15%	23.00
10%	19.50	16%	24.00
11%	20.00	17%	25.50

Other Ferroalloys

Ferrotungsten, per lb. wo. del., carloads	$1.08
Ferrotungsten, less carloads	$1.15 to 1.20
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	10.00c
Ferrochromium, 2% carbon	17.00c to 17.50c
Ferrochromium, 1% carbon	19.00c to 20.00c
Ferrochromium, 0.10% carbon	23.50c to 25.00c
Ferrochromium, 0.06% carbon	25.50c to 27.00c
Ferrovanadium, del., per lb. contained Va.	$3.05 to $3.30
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace in carloads	160.00
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base per gross ton	68.00
Ferromolybdenum, per lb. Mo., del.	95c.
Calcium molybdate, per lb. Mo., del.	80c.
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton	$91.00
Silico spiegel, per ton, f.o.b. furnace, car lots	42.50
Ton lots or less, per ton	47.50
Silico-manganese, gross ton, delivered:	
2.50% carbon grade	105.00
1% carbon grade	115.00
Spot prices	$5 a ton higher

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.80
Old range non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algerian	8c. to 8.50c.
Iron, low phos., Swedish, average 68½% iron	9.00c.
Iron, basic or foundry, Swedish, average 65% iron	8.00c.
Iron, basic or foundry, Russian, aver. 63% iron (nom.)	9.00c.
Manganese, Caucasian, washed 52%	24.00c.
Manganese, African, Indian, 50-52%	23c. to 24c.
Manganese, Brazilian, 46 to 48%	21c. to 22c.

	Per Gross Ton
Tungsten, Chinese wolframite	$10.75 to $11.00
Tungsten, domestic scheelite	$10.00 to 10.50
Chrome, 45%, Cr_2O_3, crude, c.i.f. Atlantic seaboard	18.00
Chrome, 48%, Cr_2O_3, c.i.f. Atlantic seaboard	20.00

Fluorspar

	Per Net Ton
Domestic, washed gravel, 85-5, Kentucky and Illinois mines, freight allowed, Pittsburgh basis	$17.31
No. 2 lump, 85-5, Kentucky and Illinois mines, freight allowed, Pittsburgh basis	19.31
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	16.00 to 16.75
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	30.00

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$7.75 to $8.25
No. 2 heavy melting steel	6.50 to 7.00
No. 2 railroad wrought	8.00 to 8.50
Scrap rails	8.00 to 8.50
Rails 3 ft. and under	10.50 to 11.00
Sheet bar crops, ordinary	8.00 to 8.50
Compressed sheet steel	7.00 to 7.50
Hand bundled sheet steel	6.50 to 7.00
Hvy. steel axle turnings	7.00 to 7.50
Machine shop turnings	5.00 to 5.50
Short shov. steel turnings	5.00 to 5.50
Short mixed borings and turnings	5.00 to 5.50
Cast iron borings	5.00 to 5.50
Cast iron carwheels	8.00 to 8.50
Heavy breakable cast	8.00 to 8.50
No. 1 cast	9.00 to 10.00
Railr. knuckles and couplers	8.50 to 9.00
Rail. coil and leaf springs	8.50 to 9.00
Rolled steel wheels	8.50 to 9.00
Low phos. billet crops	10.50 to 11.00
Low phos. sheet bar crops	10.50 to 11.00
Low phos. plate scrap	9.00 to 9.50
Low phos. punchings	9.00 to 9.50
Steel car axles	10.00 to 10.50

CHICAGO

Delivered Chicago district consumers:

	Per Gross Ton
Heavy melting steel	$5.00 to $5.50
Shoveling steel	5.00 to 5.50
Frogs, switches and guards	4.50 to 5.00
Hydraulic comp. sheets	3.00 to 3.50
Drop forge flashings	3.50 to 4.00
No. 1 busheling	3.00 to 3.50
Rolled carwheels	6.50 to 7.00
Railroad tires	6.50 to 7.00
Railroad leaf springs	7.50 to 8.00
Axle turnings	4.00 to 4.50
Steel couplers and knuckles	5.50 to 6.00
Coil springs	7.50 to 8.00
Axle turnings (elec. fur.)	4.50 to 5.00
Low phos. punchings	7.00 to 7.50
Low phos. plates, 12 in. and under	6.50 to 7.00
Cast iron borings	2.00 to 2.50
Short shoveling turnings	2.00 to 2.50
Machine shop turnings	1.75 to 2.25
Rerolling rails	6.75 to 7.25
Steel rails, less than 3 ft.	7.50 to 8.00
Steel rails, less than 2 ft.	8.00 to 8.50
Angle bars, steel	6.50 to 7.00
Cast iron carwheels	5.50 to 6.00
Railroad malleable	4.50 to 5.00
Agricultural malleable	4.50 to 5.00
*Relaying rails, 56 to 60 lb.	15.00 to 17.00
*Relay rails, 65 lb. and up	18.00 to 23.00

	Per Net Ton
Iron angle and splice bars	$5.25 to $5.75
Iron arch bars, transoms	4.50 to 5.00
Iron car axles	10.50 to 11.00
Steel car axles	6.75 to 7.25
No. 1 railroad wrought	3.75 to 4.25
No. 2 railroad wrought	4.00 to 4.50
No. 1 busheling	2.50 to 3.00

2 busheling	$1.50 to	$2.00
Automotive tires, smooth	7.50 to	8.50
Tire and flues	1.25 to	1.75
No. 1 machinery cast	6.00 to	6.50
No. automobile cast	6.75 to	7.25
No. 1 railroad cast	5.25 to	5.75
No. 1 agricultural cast	4.50 to	5.00
Stove plate	5.00 to	5.50
Grate bars	5.25 to	5.75
Brake shoes	5.75 to	6.25

*Relaying rails, including angle bars match, are quoted f.o.b. dealers' yards.

PHILADELPHIA

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$6.00 to	$6.50
No. 2 heavy melting steel	4.50 to	5.00
No. 1 railroad wrought	7.00 to	7.50
Bundled sheets	4.00 to	4.50
Hydraulic compressed, new	4.50 to	5.00
Hydraulic compressed, old	4.00 to	4.50
Machine shop turnings	3.00 to	3.50
Heavy axle turnings	5.50 to	6.00
Cast borings (nom.)	3.00 to	3.50
Heavy breakable cast	7.50 to	8.00
Stove plate (steel works)	6.00 to	6.50
No. 1 low phos. heavy	9.50 to	10.00
Couplers and knuckles	6.50 to	7.00
Rolled steel wheels	6.50 to	7.00
No. 1 blast furnace (nom.)	3.00 to	3.50
Spec. iron and steel pipe	5.50 to	6.00
Malleable	10.00 to	11.00
Steel axles	11.50 to	12.00
No. 1 forge fire	5.50 to	6.00
Cast iron carwheels	8.00 to	8.50
No. 1 cast	8.00 to	8.50
Cast borings (chem.)	8.00 to	10.00
Steel rails for rolling	9.00 to	9.50

CLEVELAND

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$6.25 to	$6.75
No. 2 heavy melting steel	5.50 to	5.75
Compressed sheet steel	5.50 to	6.00
Light bundled sheet stampings	4.50 to	5.00
Drop forge flashings		5.00
Machine shop turnings	2.00 to	2.50
Short shoveling turnings	4.00 to	4.50
No. 1 busheling	5.00 to	5.50
Steel axle turnings	5.00 to	5.50
Low phos., billet crops	9.00 to	10.00
Cast iron borings	3.50 to	4.00
Mixed borings and short turnings	3.00 to	3.50
No. 2 busheling	3.00 to	3.50
No. 1 cast	6.50 to	7.00
Railroad grate bars	5.00 to	5.50
Stove plate	5.00 to	5.50
Rails under 3 ft.	8.50 to	9.00
Rails for rolling	8.50 to	9.00
Railroad malleable	7.25 to	7.50
Cast iron carwheels	7.00 to	7.50

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:

No. 1 heavy melting steel	$6.50 to	$7.00
No. 2 heavy melting scrap		5.00
Scrap rails	6.75 to	7.25
New hydraul. comp. sheets		5.00
Old hydraul. comp. sheets		4.00
Drop forge flashings		5.00
No. 1 busheling		5.00
Hvy. steel axle turnings		6.00
Machine shop turnings	4.00 to	4.50
Knuckles and couplers		10.00
Coil and leaf springs		10.00
Rolled steel wheels		10.00
Low phos. billet crops	10.00 to	10.50
Short shov. steel turnings	5.50 to	6.00
Short mixed borings and turnings	3.75 to	4.25
Cast iron borings	3.75 to	4.25
No. 2 busheling	3.50 to	4.00
Steel car axles	10.00 to	11.00
Iron axles	10.00 to	11.00
No. 1 machinery cast	9.00	
No. 1 cupola cast	8.25 to	8.75
Stove plate		7.00
Steel rails, 3 ft. and under	8.75 to	9.25
Cast iron carwheels	8.00 to	9.00
Industrial malleable	7.00 to	7.50
Railroad malleable	7.00 to	7.50
Chemical borings	7.50 to	8.00

BIRMINGHAM

Per gross ton deliverel consumers' yards:

Heavy melting steel	$7.00 to	$7.50
Scrap steel rails	7.50 to	8.00
Short shoveling turnings		4.00
Stove plate		6.00
Steel axles		7.00
Iron axles		7.00
No. 1 railroad wrought	4.50 to	5.00
Rails for rolling	8.00 to	8.50
No. 1 cast	7.50 to	8.00
Tramwar wheels		8.00
Cast iron borings, chem.		8.50

ST. LOUIS

Per gross ton delivered consumers' yards:

Selected heavy steel	$5.50 to	$6.00
No. 1 heavy melting	4.25 to	4.75
No. 2 heavy melting	4.50 to	5.00
No. 1 locomotive tires	4.75 to	5.25
Misc. stand.sec. rails	5.50 to	6.00
Railroad springs	6.50 to	7.00
Bundled sheets	2.75 to	3.25
No. 2 railroad wrought	4.25 to	4.75
No. 1 busheling	4.00 to	4.25
Cast iron borings and shoveling turnings	2.75 to	3.25
Iron rails	7.00 to	7.50
Rails for rolling	6.00 to	6.50
Machine shop turnings	1.50 to	2.00
Heavy turnings	3.00 to	3.50
Steel car axles	8.25 to	8.75
Iron car axles	11.00 to	11.50
Wrot. iron bars and trans.	5.00 to	5.50
No. 1 railroad wrought	3.50 to	4.00
Steel rails less than 3 ft.	8.50 to	9.00
Steel angle bars	6.00 to	6.50
Cast iron carwheels	4.50 to	5.00
No. 1 machinery cast	6.50 to	7.00
Railroad malleable	4.00 to	4.50
No. 1 railroad cast	5.75 to	6.25
Stove plate	5.50 to	6.00
Relay, rails, 60 lb. and under	16.00 to	16.50
Relay, rails, 60 lb. and over	20.00 to	21.00
Agricult. malleable	5.00 to	5.50

NEW YORK

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	$2.85 to	$4.00
No. 2 heavy melting steel		1.50
Heavy melting steel (yard)		1.50
No. 1 hvy. breakable cast	4.50 to	4.75
Stove plate (steel works)	2.25 to	2.75
Machine shop turnings	0.50 to	1.00
Short shoveling turnings	0.50 to	1.00
Cast borings	0.50 to	1.00
No. 1 blast furnace	0.50 to	1.00
Steel car axles	8.00 to	8.50
Spec. iron and steel pipe	2.00 to	2.50
Forge fire		3.25
No. 1 railroad wrought	4.00 to	4.50
No. 1 yard wrought, long	3.25 to	3.50
Rails for rolling	5.00 to	5.50
No. 1 cast	5.00 to	5.25
No. 2 cast	4.00 to	4.50
Stove plate (foundry)		3.25
Malleable cast (railroad)	3.50 to	4.00
Cast borings (chemical)	6.00 to	6.50

Per gross ton, delivered local foundries:

No. 1 machinery cast	$7.00 to	$7.50
No. 1 hvy. cast (cupola size)	7.00 to	7.50
No. 2 cast	4.00 to	4.50

BOSTON

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	$3.35 to	$3.50
Scrap T rails		3.50
Machine shop turnings	0.80 to	1.00
Cast iron borings		1.05
Bundled skeleton, long	2.00 to	2.10
Forge flashings	3.00 to	3.50
Blast furnace scrap	0.90 to	1.00
Forge scrap	3.00 to	3.25
Shafting	9.50 to	10.00
Steel car axles	9.00 to	9.50
Wrought pipe	4.00 to	4.25
Rails for rolling	4.50 to	5.00
Cast iron borings, chemical	7.00 to	7.25

Per gross ton delivered consumers' yards:

Textile cast	$7.00 to	$7.50
No. 1 machinery cast	7.50 to	8.00
Stove plate	5.00 to	5.25
Railroad malleable	10.50 to	11.00

CINCINNATI

Dealers' buying prices per gross ton:

Heavy melting steel	$4.50 to	$5.00
Scrap rails for melting	5.00 to	5.50
Loose sheet clippings	1.00 to	1.50
Bundled sheets	3.25 to	3.75
Cast iron borings	2.75 to	3.25
Machine shop turnings	2.50 to	3.00
No. 1 busheling	3.75 to	4.25
No. 2 busheling	2.00 to	2.50
Rails for rolling	6.00 to	6.50
No. 1 locomotive tires	7.00 to	7.50
Short rails	8.00 to	8.50
Cast iron carwheels	6.00 to	6.50
No. 1 machinery cast	7.50 to	8.00
No. 1 railroad cast	7.00 to	7.50
Burnt cast	3.25 to	3.75
Stove plate	3.25 to	3.75
Agricultural malleable	6.50 to	7.00
Railroad malleable	7.00 to	7.50

DETROIT

Dealers' buying prices per gross ton:

Hvy. melting steel	$4.25 to	$4.75
Borings and short turnings	1.50 to	2.00
Long turnings	1.00 to	1.50
No. 1 machinery cast	7.00 to	7.50
Automotive cast	8.50 to	9.00
Hydraul. comp. sheets	3.25 to	3.75
Stove plate	3.25 to	3.75
New No. 1 busheling	3.25 to	3.75
Old No. 2 busheling	1.25 to	1.75
Sheet clippings	1.25 to	1.75
Flashings	3.50 to	4.00

CANADA

Dealers' buying prices per gross ton:

	Toronto	Montreal
Heavy melting steel	$7.00	$6.00
Rails, scrap	7.00	6.00
No. 1 wrought	6.00	8.00
Machine shop turnings	2.00	2.00
Boiler plate	5.00	4.50
Heavy axle turnings	2.50	2.50
Cast borings	2.00	2.00
Steel borings	2.00	2.00
Wrought pipe	7.00	9.00
Steel axles	7.00	11.00
Axles, wrought iron	7.00	11.00
No. 1 machinery cast	12.50	10.00
Stove plate	10.00	8.00
Standard carwheels	10.00	8.50
Malleable	10.00	8.00

Warehouse Prices for Steel Products

PITTSBURGH

	Base per Lb.
Plates	2.85c.
Structural shapes	2.85c.
Soft steel bars and small shapes	2.60c.
Reinforcing steel bars	2.60c.
Cold-finished and screw stock—	
Rounds and hexagons	2.95c.
Squares and flats	3.45c.
Hoops and bands, under ¼ in. thread	2.95c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.15c.
Galv. sheets (No. 24), 25 or more bundles	3.65c.
Hot-rolled sheets (No. 10)	3.10c.
Galv. corrug. sheets (No. 28), per square (less than 3750 lb.)	$3.74
Spikes, large	2.50c.
Small	2.75c. to 2.90c.
Boat	3.00c.
Track bolts, all sizes, per 100 count,	70 per cent off list
Machine bolts, 100 count	70 per cent off list
Carriage bolts, 100 count	70 per cent off list
Nuts, all styles, 100 count,	70 per cent off list
Large rivets, base per 100 lb	$3.00
Wire, black, soft ann'l'd, base per 100 lb	2.75
Wire, galv. soft, base per 100 lb	3.20
Common wire nails, per keg	2.35
Cement coated nails, per keg	2.35

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 999 lb.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	2.75c.
Reinforcing bars, billet steel	1.65c. to 1.75c.
Rail steel reinforcement	1.45c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons	3.00c.
Flats and squares	3.50c.
Bands, ⅞ in. (in Nos. 10 and 12 gages)	2.95c.
Hoops (No. 14 gage and lighter)	3.50c.
Hot-rolled annealed sheets (No. 22)	3.55c.
Galv. sheets (No. 24)	4.10c.
Hot-rolled sheets (No. 10)	3.20c.
Spikes (⅜ in. and lighter)	3.45c.
Track bolts	4.30c.
Rivets, structural	3.75c.
Rivets, boiler	3.75c.
	Per Cent Off List
Machine bolts	70
Carriage bolts	70
Coach and lag screws	70
Hot-pressed nuts, sq., tap. or blank	70
Hot-pressed nuts, hex., tap. or blank	70
Hex. head cap screws	80
Cup point set screws	70 and 10
Flat head bright wood screws	52½
Spring cotters	60
Stove bolts	80
Rd. hd. tank rivets, 7/16 in. and smaller	65
Wrought washers	$4.50 off list
No. 8 black ann'l'd wire, per 100 lb.	$3.45
Com. wire nails, base per keg	2.30
Cement c't'd nails, base per keg	2.30

NEW YORK

	Base per Lb.
Plates and struc. shapes	2.70c. to 3.10c.
Soft steel bars, small shapes	2.70c. to 3.10c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	6.00c. to 6.50c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	3.30c.
Flats and squares	3.80c.
Cold-roll. strip, soft and quarter hard	4.95c.
Hoops	3.30c.
Bands	3.30c.
Hot-rolled sheets (No. 10)	3.00c. to 3.25c.
Hot-rolled ann'l'd sheets (No. 24*)	3.50c.
Galvanized sheets (No. 24*)	4.00c.
Long terne sheets (No. 24)	4.50c.
Standard tool steel	12.00c.
Wire, black annealed (No. 10)	3.60c.
Wire, galv. annealed (No. 10)	4.05c.
Tire steel, ½ x ½ in. and larger, smooth finish, 1 to 2½ x ¼ in. and larger	3.40c. 3.75c.
Open-hearth spring steel, bases	4.50c. to 7.00c.
Common wire nails, base, per keg	$2.60
	Per Cent
Machine bolts, cut thread:	Off List
¾ x 6 in. and smaller	.65 to 65 and 10
1 x 30 in. and smaller	.65 to 65 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	.65 to 65 and 10
¾ x 20 in. and smaller	.65 to 65 and 10
Boiler Tubes	Per 100 Ft.
Lap welded, 2-in.	$18.65
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65

*No. 28 and lighter, 36 in. wide, 20c higher per 100 lb.

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.00c.
Cold-fin. rounds, shafting, screw stock	3.50c.
Hot-rolled annealed sheets (No. 24)	3.80c.
Galv. sheets (No. 24)	4.35c.
Hot-rolled sheets (No. 10)	3.45c.
Black corrug. sheets (No. 24)	3.85c.
Galv. corrug. sheets	4.40c.
Structural rivets	4.00c.
Boiler rivets	4.00c.
	Per Cent Off List
Tank rivets, ⅞ in. and smaller, 100 lb. or more	65
Less than 100 lb.	60
Machine bolts	70
Carriage bolts	70
Lag screws	70
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	70
Less than 200 lb.	60
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	70
Less than 200 lb.	60

PHILADELPHIA

	Base per Lb.
*Plates, ¼-in. and heavier	2.10c.
*Structural shapes	2.10c.
*Soft steel bars, small shapes, iron bars (except bands)	2.10c.
Reinfore. steel bars, sq., twisted and deform.	2.30c.
Cold-fin. steel, rounds and hex.	3.35c.
Cold-fin. steel, sq. and flats	3.85c.
*Steel hoops	2.65c.
*Steel bands, No. 12 to 3/16 in. incl.	2.40c.
Spring steel	5.00c.
Hot-rolled annealed sheets (No. 24)	3.55c.
Galvanized sheets (No. 24)	3.75c.
*Hot-rolled and annealed sheets (No. 10)	2.55c.
Diam. pat. floor plates, ¼ in.	5.00c.
Swedish iron bars	5.60c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

*Base prices for 15,000-lb. orders; extra apply for smaller quantities.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	2.95c.
Soft steel bars	2.75c.
Reinfore. steel bars	1.75c. to 1.95c.
Cold-fin. rounds and hex.	2.95c.
Cold-fin. flats and sq.	3.45c.
Flat rolled steel under ¼ in.	3.00c.
Cold-finished strip	5.25c.
Hot-rolled annealed sheets (No. 24)	3.25c.
Galvanized sheets (No. 24)	3.75c.
Hot-rolled sheets (No. 10)	3.00c.
Black ann'l'd wire, per 100 lb.	$2.75
No. 9 galv. wire, per 100 lb.	3.20
Com. wire nails, base per keg	2.35

*Net base, including boxing and cutting to length.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.00c.
New billet reinfore. bars	3.00c.
Rails steel reinfore. bars	3.00c.
Hoops	3.90c.
Bands	3.20c.
Cold-fin. rounds and hex.	3.29c.
Squares	3.75c.
Hot-rolled annealed sheets (No. 24)	3.75c.
Galv. sheets (No. 24)	4.25c.
Hot rolled sheets (No. 10)	3.30c.
Structural rivets	4.20c.
Small rivets	60 per cent off list
No. 9 ann'l'd wire, per 100 lb.	$3.00
Com. wire nails, base per keg (10 to 49 kegs)	2.65
Larger quantities	2.50
Cement c't'd nails, base 100-lb. keg	2.95
Chain, per 100 lb.	10.25
	Net per 100 Ft.
Seamless steel boiler tubes, 2-in.	$17.50
4-in.	36.00
Lap-welded steel boiler tubes, 2-in.	16.50
4-in.	34.50

BUFFALO

	Base per Lb.
Plates and struc. shapes	3.20c.
Soft steel bars	2.95c.
Reinforcing bars	2.95c.
Cold-fin. flats and sq.	3.50c.
Rounds and hex.	3.00c.
Cold-rolled strip steel	5.25c.
Hot-rolled annealed sheets (No. 24)	3.70c.
Galv. sheets (No. 24)	4.05c.
Bands	3.30c.
Hoops	3.95c.
Hot-rolled sheets (No. 10)	3.45c.
Com. wire nails, base per keg	$2.60
Black wire, base per 100 lb.	3.35

BOSTON

	Base per Lb.
Plates	*3.25c.
Structural shapes	*3.25c.
Soft steel bars, small shapes	*3.25c.
Reinforcing bars	3.10c. to 3.25c.
Iron bars—	
Refined	3.25c.
Best refined	4.60c.
Spring steel, open-hearth	5.00c.
Tire steel	4.50c. to 4.75c.
Bands	*3.75c. to 4.25c.
Hoop steel	4.90c. to 5.40c.
Cold-rolled steel—	
Rounds and hex.	3.60c. to 4.15c.
Squares and flats	4.10c. to 5.35c.
Rivets, structural or boiler	4.80c.
	Per Cent Off List
Machine bolts	65
Carriage bolts	65
Lag screws	65
Hot-pressed nuts	65
Cold-punched nuts	65
Stove bolts	70 and 10

*Base price (250 to 999 lb.); less than 250 lb., add 50c. per 100 lb.; 1000 to 7999 lb., deduct 15c.; 8000 to 14,999 lb., deduct 25c.; 15,000 lb. and larger lots, deduct 35c.

PACIFIC COAST

	Base per Lb.		
	San Francisco	Los Angeles	Seattle
Plates and struc. shapes, ¼-in. and heavier	3.25c.	3.30c.	3.60c.
Soft steel bars	3.25c.	3.30c.	3.60c.
Reinforcing bars	3.00c.	3.00c.	3.00c.
Hot-rolled annealed sheets (No. 24)	3.95c.	4.20c.	4.50c.
Hot-rolled sheets (No. 10)	3.50c.	3.50c.	4.00c.
Galv. sheets (No. 24)	4.55c.	4.50c.	5.00c.
Struc. rivets, ½ in. and larger, less than 1000 lbs.	5.00c.	5.00c.	4.00c.
Cold-finished steel			
Rounds	5.50c.	5.50c.	4.50c.
Squares and hexagons	6.75c.	6.75c.	5.75c.
Flats	7.25c.	7.25c.	6.75c.
Common wire nails, base per keg in less carloads	$2.90	$2.90	$3.00

Plates, shapes, bars, bands and hot-rolled sheets, No. 16 gage and heavier, subject to reductions for quantity. Cold-finished quotations based on 100 lb. minimum quantity.

Machine Tool Outlook Slightly Improved

July Probably Poorest Month to Date in Sales, But Demand Shows Signs of Upturn

JULY was probably the worst month to date this year in machine tool bookings. However, sentiment has improved at Cincinnati and there have been slight gains in buying and in activity among machine tool consumers at Chicago and a few other points. In the East most of the business that has been recently done and much of that which will come into the market is in special machines. This means that machine tool builders will have to put men at work to build the equipment, thus making for an almost immediate gain in employment. At Pittsburgh there are persistent reports of impending purchases of steel mill equipment by both domestic and foreign plants.

The Amtorg Trading Corpn., New York, is reported to have placed a substantial order for cutter grinders, and an automobile manufacturer has bought crankshaft equipment. The International Harvester Co. has placed several orders for small tools, and it is possible that these may be precursors of larger purchases.

A number of jobbing machine shops in the Chicago district are busier, one of them operating both day and night shifts. Tool and die shops in Detroit are becoming more active on tools and dies for new automobile models. A number of smaller manufacturers at Chicago have increased operations. Notable among them are plants making radio sets for automobiles. One of them is reported to have booked an order for 25,000 sets from a leading manufacturer of motor cars.

NORTH ATLANTIC

Commissioner of Correction, State Office Building, Albany, N. Y., has asked bids on general contract for one-story mechanical shop at Elmira Reformatory, Elmira, N. Y. Commissioner of Architecture, same address, is architect.

Mackay Radio & Telegraph Co., 67 Broad Street, New York, has purchased land at Napeague Harbor, near Montauk, L. I., for radio transmitting station, to include steel towers, power station and other units, scheduled to be ready in October. Cost over $75,000 with equipment.

United States Engineer Office, First District, New York, asks bids until Aug. 10 for two cast steel shafts and four cast steel scow engine frames (Circular 29).

Apex Tool & Die Corpn., New York, has been organized by Louis Glickhouse, 184 East 102nd Street, to manufacture tools, dies and kindred mechanical products.

New York, Ontario & Western Railway Co., 370 Lexington Avenue, New York, plans rebuilding machine shops at car repair works, Middletown, N. Y., recently destroyed by fire. Loss over $45,000 with equipment.

Westchester County Park Commission, County Building, White Plains, N. Y., let general contract to T. & C. Miller, Yonkers Avenue, Yonkers, N. Y., for two-story maintenance and repair shop, 70 x 215 ft., with boiler plant, at New Castle, N. Y. Cost over $40,000 with equipment.

Sav-A Call Lock Co., New York, has been organized by Benjamin Gran, 138 Haseco Avenue, Port Chester, N. Y., and associates, to manufacture locks and locking devices.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Aug. 9 for one motor-driven shearing, gap-splitting and squaring machine (Schedule 8446), 480 storage battery testing outfits (Schedule 8460), aluminum desk chairs (Schedule 8450), seven low pressure motor-driven blowers (Schedule 8455), nine chronometric tachometers (Schedule 8464), and three portable locomotive type boilers, 60-hp. capacity (Schedule 8467) for New York Navy Yard; until Aug. 16, 11,910 steel boxes for packing smokeless powder (Schedule 8399) for White Plains, N. Y.

Mergenthaler Linotype Co., 29 Ryerson Street, Brooklyn, manufacturer of linotype machines, parts, etc., has secured substantial interest in Photo-Cylinder Corpn., New York, recently organized to manufacture textile printing cylinders and equipment using new method of operation, and will develop new line of printing equipment.

Department of Mental Hygiene, State Office Building, Albany, N. Y., has asked bids on general contract for additions to institution at Letchworth Village, Thiells, N. Y., including one-story industrial building. Commissioner of Architecture, same address, is architect.

Arcoil Mfg. Co., 80 Duryea Street, Newark, manufacturer of mechanical blowers, parts, etc., has leased plant at Hillside, formerly occupied by General Brass Foundry, for new works. Capacity will be increased.

Hawthorne Sound System, Inc., Paterson, N. J., has been organized by Rudolph W. and Edward W. Huebner, Hawthorne, N. J., to manufacture sound equipment and devices.

Florence Township Committee, Florence, N. J., is considering erection of municipal electric light and power plant. Charles B. Green, township engineer, has been directed to secure details of equipment and estimates of cost, latter expected to approximate $60,000.

Water Committee, Board of Village Trustees, Village Hall, South Orange, N. J., asks bids until Aug. 12 for electric equipment for water department. Ira T. Redfern, address noted, is village engineer.

Baker Paint & Varnish Co., 228 Suydam Avenue, Jersey City, N. J., plans rebuilding part of factory recently damaged by fire. Loss about $45,000 with equipment.

Stultz Oil Burner Corpn., Keyport, N. J., care of Ezra W. Karkus, Front Street, representative, has been organized by Benjamin I. Kantor, Keyport, and associates, capital $125,000, to manufacture oil-burning equipment and devices.

RCA-Victor Co., Camden, N. J., manufacturer of radio equipment, talking machines and parts, has resumed operations after short curtailment, giving employment to about 5000 persons.

Public Service Coordinated Transport, Public Service Terminal, Newark, plans rebuilding part of shops and car barns at Camden, N. J., recently destroyed by fire. Machine shops and wood-working department sustained loss. Entire damage more than $125,000 with equipment.

Baldwin Locomotive Works, Philadelphia, has asked bids on general contract for one-story addition, including improvements in unit of present plant.

J. G. Brill Co., Sixty-second Street and Woodland Avenue, Philadelphia, manufacturer of railway cars and trucks, has secured contract from Indianapolis Railways, Inc., Indianapolis, for 40 electric street cars and trolley buses, totaling about $600,000, and will advance operations.

Borough Council, Carlisle, Pa., is planning purchase of steel standpipe to increase water pressure for municipal system.

Le Mallette, Inc., Philadelphia, has been organized by Nathan Kaiser, 4816 Summerdale Avenue, and associates, to manufacture metal tubing, caps and other metal devices.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Aug. 16 for electric transformers, switching equipment and one distribution switchboard (Schedule 8434) for Philadelphia Navy Yard.

York Oil Burner Co., York, Pa., manufacturer of oil burners and oil-burning equipment, has increased production schedule with larger working force. Company has recently arranged expansion program at plant.

Freihofer Baking Co., Twentieth Street and Indiana Avenue, Philadelphia, has awarded general contract to George H. Hardner, Lentz Building, Allentown, Pa., for new plant at last noted place, to replace unit recently destroyed by fire. Installation will include boiler plant, traveling ovens, conveying and other mechanical equipment. Cost about $400,000 with machinery. Austin Co., 1015 Chestnut Street, Philadelphia, is architect and engineer.

Common Council, Morrisville, Pa., is planning extensions and improvements in municipal waterworks, including elevated steel tank and tower, filtration and other equipment. Cost about $50,000.

Bliss-Latham Corpn., Niagara Falls, N. Y., has been organized to take over H. R. Bliss Co., Inc., with local plant, manufacturer of wire-stitching machinery for fiber and corrugated boxes, and Latham Machinery Co., Chicago, manufacturer of printers' machinery, including wire stitchers, perforators, punching machines, etc. New company will continue operations at present plants. Dexter Folder Co., 28 West Twenty-third Street, New York, manufacturer of folding machines, has held controlling interest in Latham company and will be active in new company.

Prosperity Co., Beattie Street, Syracuse, N. Y., manufacturer of cloth pressing machinery, has resumed production following curtailment for several months.

Rudley Mfg. Co., Syracuse, N. Y., has been organized by David M. Hayman, 1010 South McBride Street, and Milton E. Berman, 542 Cedar Street, to manufacture bed springs and kindred products.

Pfaudler Co., 89 East Avenue, Rochester, N. Y., manufacturer of glass-lined steel vessels and equipment, has authorized expansion program, including installation of new furnace equipment and other machinery. Cost about $125,000 with equipment.

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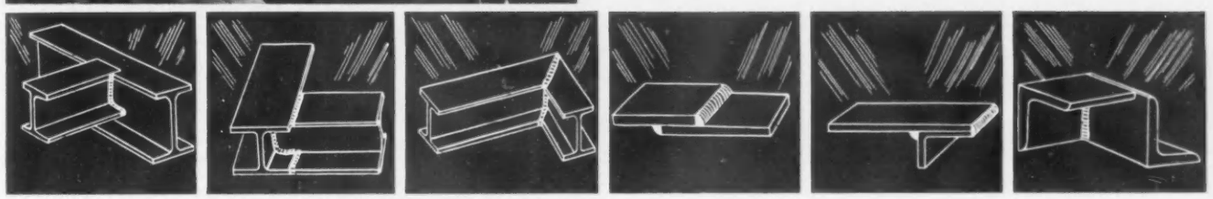
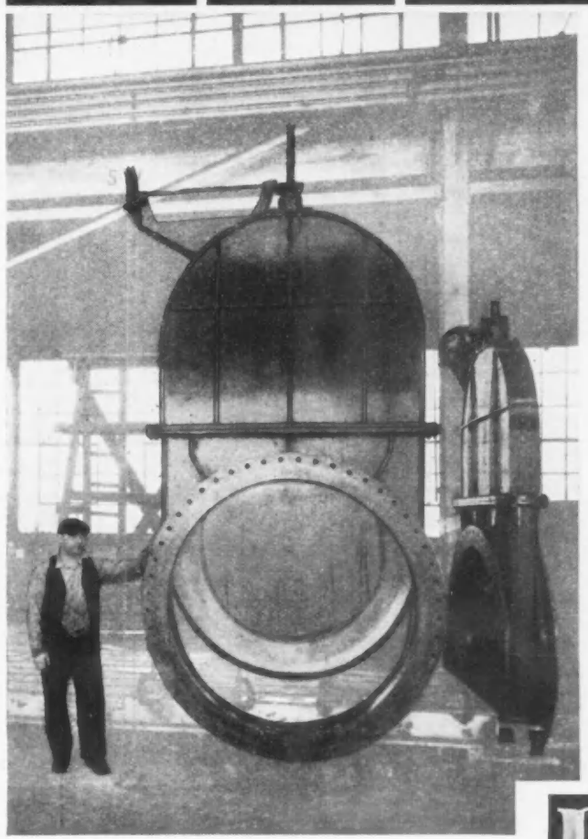
it has very definite ADVANTAGES





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Rolled Steel is a thoroughly worked product, free from defects, tough and strong. It has been adapted to the construction of many products—machinery bases, beds, frames, housings, pedestals, etc. Illustrated herewith is a 60″ gate valve for low pressure gas line, manufactured by the Youngstown Welding and Engineering Company. The 50% savings in weight effected by the use of welded Rolled Steel is a typical example. Welded machinery construction merits your investigation.

CARNEGIE STEEL COMPANY

Subsidiary of United States Steel Corporation

PITTSBURGH, PA.

CENTRAL DISTRICT

Board of County Commissioners, Department of Highways, County Office Building, Pittsburgh, asks bids until Aug. 9 for corrugated metal pipe, steel reinforcing bars and other supplies.

Hampton Electric Tool Co., Pittsburgh, has been organized by George E. Hampton and Neville C. McKelvy to take over and expand company of same name at 111 South Main Street, manufacturer of electric tools and equipment.

Board of Trustees, State Teachers' College, Slippery Rock, Pa., plans improvements in steam power plant, including installation of a 200-hp. boiler and auxiliary equipment. J. N. Chester, Clark Building, Pittsburgh, is consulting engineer.

Westinghouse Electric & Mfg. Co., East Pittsburgh, has designed new line of fractional horsepower motors and will carry out increased production in this department at local works. Company has also redesigned a number of former types of small motor units.

Wilson-Snyder Mfg. Corpn., Braddock, Pa., manufacturer of pumping machinery and kindred equipment, plans rebuilding storage and distributing plant unit, recently destroyed by fire. Loss over $40,000 with equipment.

Overhead Door Co., Lewistown, Pa., manufacturer of metal garage doors, etc., is running on increased production schedule, with last month showing highest record for a year.

Federal Laboratories, Inc., 185 Forty-first Street, Pittsburgh, manufacturer of sub-machine guns, tear gas guns and other ordnance, is running full time with increased working quota. Last month was second best in history of company.

City Council, Crestline, Ohio, is considering installation of municipal electric light and power plant. Survey and estimates of cost will be made by R. Husselman, Hippodrome Building, Cleveland, consulting engineer.

Superflex Tire Co., East Palestine, Ohio, recently organized by I. L. Wiltsie, East Palestine, and associates, has taken over former plant of National Tire & Rubber Co. and will install new machinery for manufacture of automobile tires. C. H. Moore will be plant superintendent.

National Cash Register Co., Dayton, Ohio, is increasing production schedule. Company has recently secured order from Sears, Roebuck & Co., Chicago, for cash registers totaling $97,000.

Akron Super Steel Castings, Inc., Akron, Ohio, care of Russell W. Thomas, Second National Bank Building, has been organized by Clyde Mitchella, Akron, and associates to manufacture steel castings.

Remington-Rand, Inc., 205 East Forty-second Street, New York, has increased operations at Norwood, Ohio, plant, adopting full time schedule and advancing working quota to 850 persons. Output is given over primarily to accounting and tabulating machines, and bookkeeping machines.

Board of Education, 511 West Court Street, Cincinnati, has authorized installation of manual training department in new two-story and basement school in Mount Washington district. Cost over $275,000. General contract recently let to Ferro Concrete Construction Co., Third and Elm Streets. William E. Bodenstein, Second National Bank Building, is mechanical engineer.

Contracting Officer, Material Division, Wright Field, Dayton, Ohio, asks bids until Aug. 8 for 570 switch assemblies, 1200 panel assemblies and 500 lamp assemblies (Circular 15); until Aug. 9, nine tow target mounts, tow target brace assemblies, etc. (Circular 24); until Aug. 10, 60 aerial delivery container assemblies (Circular 17), 40 landing gear cross strut upper attachment fittings, landing gear cross side strut upper bolts (Circular 20); until Aug. 16, 150 fuel system unit assemblies (Circular 21); until Aug. 17, valve assemblies, pump assemblies, springs, strainers, etc. (Circular 23); until Aug. 22, 120 starter assemblies (Circular 26).

City Council, Columbiana, Ohio, is investigating types of equipment for municipal electric light and power plant and contemplates early call for bids. Cost about $160,000 with machinery. Board of Public Affairs will be in charge.

Chamber of Commerce, Orrville, Ohio, is interested in project to establish local foundry for production of small iron and steel castings, and will head campaign to secure funds.

Cleveland Heater Co., 1900 West 112th Street, Cleveland, manufacturer of automatic gas and electric water heaters, parts, etc., has let general contract to Tepper & Limowitz, 3598 East 142nd Street, for one-story addition, 100 x 239 ft. Cost over $55,000 with equipment. George S. Rider, Marshall Building, is architect and engineer.

Willys-Overland Co., Toledo, Ohio, has advanced production schedules for new streamline automobile models, with increased working force. July output was stepped up 20 per cent over estimates planned for that month; sales for first half of July showed gain of 93.8 per cent over same period last year.

State Board of Education, Indianapolis, has awarded general contract to Roy Unversaw, 4202 Cornelius Avenue, for one-story machine shop and canning building, 41 x 61 ft., at school at Claremont, near Indianapolis. O. N. Mueller, Indiana Trust Building, Indianapolis, is State consulting engineer.

Golden Combination Instrument Co., Denver, Ind., has been organized to take over and expand Golden Compass Co., same place, manufacturer of precision instruments.

Logansport Radiator Equipment Co., Logansport, Ind., manufacturer of steam radiators, parts, etc., has resumed operations following curtailment for eight months, reinstating about 100 men.

City Council, Hammond, Ind., is considering erection of a municipal electric light and power plant. It is proposed to arrange for joint station to furnish service to Hammond, Whiting and Indiana Harbor, Ind., and City Councils of last two noted places will be interested in project.

Stutz Motor Car Co., 1002 North Capitol Avenue, Indianapolis, is increasing production schedules and has advanced working force about 40 per cent. Portion of output is for export account.

Consolidated Concrete Machinery Co., Adrian, Mich., manufacturer of concrete-mixing and kindred equipment, has been acquired by Eugene F. Olsen, formerly connected with Besser Mfg. Co., Alpena, Mich., manufacturer of similar machinery. First noted company will be reorganized with Mr. Olsen as head.

Wilcox-Rich Corpn., Marshall, Mich., manufacturer of automobile engine parts and equipment, is increasing production and is now giving employment to about 400 men. Considerable part of output is given over to valves for Ford automobile engines.

Marine City Mfg. Corpn., 1705 First Street, Detroit, has been organized by Adolf J. Preining, 2945 Cooper Avenue, and associates to manufacture iron, steel and other metal products.

Muskegon Piston Ring Co., Muskegon, Mich., is running on a five and one-half day week, with night shift in some departments. Company has secured several large orders, including contract from Ford Motor Co.

A-B Stove Co., Battle Creek, Mich., manufacturer of coal stoves and ranges, has perfected new electric stove and will operate department for such line, covering five different models. Initial production will total about 20 stove units daily, to be stepped up to about 100 in near future.

Durant Motors, Inc., Lansing, Mich., plant, consisting of 22 units, will soon be offered at public sale by Central Trust Co., Lansing, receiver. Works have been closed for several months.

NEW ENGLAND

Fairfield State Hospital Commission, Building Committee, Hartford, Conn., asks bids until Aug. 12 for engines, generators and auxiliary equipment for power plant at State Hospital, Newtown, Conn. Walter P. Crabtree, 410 Asylum Street, Hartford, is architect.

Waltham Watch Co., Waltham, Mass., has resumed production following curtailment of several weeks and will reinstate about 600 workers.

New Haven Mfg. Co., New Haven, Conn., has been organized by F. R. Harris, Woodmont, Conn., and Boris Mininberg, New Haven, capital $50,000, to manufacture machinery and parts.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Aug. 9 for two motor-driven toolmakers' precision lathes (Schedule 8452) for Portsmouth, N. H., Navy Yard; two motor-driven drilling machines (Schedule 8388) for Newport, R. I., Navy Yard, and until Aug. 16 for 1500 ball bearings (Schedule 8416) for same yard.

D. F. Briggs Co., Attleboro, Mass., manufacturer of plated metal goods, has advanced production schedule and is now running overtime in different departments with increased working quota. Company has recently secured large order for handles for safety razors.

Connecticut Hydrogas Corpn., Portland, Conn., has authorized erection of new plant on Portland River for manufacture of nonpoisonous gasoline under new hydrogenation process. Plants will include storage and distributing facilities for handling crude oils from Texas fields. It is scheduled for completion in October. Cost over $60,000 with machinery.

Florence Stove Co., Gardner, Mass., manufacturer of oil stoves and other heating equipment, has adopted full time production schedule, reinstating about 175 employees. Orders on hand insure continuance of new basis for remainder of year.

SOUTH CENTRAL

Selma Mfg. Co., Selma, Ala., plans installation of power plant at cotton mill. Cost over $30,000 with machinery.

Kentucky Macaroni Co., South Floyd Street, Louisville, has awarded general contract to J. D. Jenkins, Louisville, for rebuilding one-story plant unit, recently damaged by fire. Cost over $50,000 with equipment. D. X. Murphy & Brother, Louisville Trust Building, are architects.

Southern Machinery Co., Jackson, Miss., has been organized by Bernie L. Lauchley, Jackson, and associates to manufacture machinery and parts.

S. & W. Construction Co., Memphis, Tenn., Erick E. Schmied, head, is planning purchase of steel bin with weighing batcher and auxiliary equipment, for sand and gravel service.

Central Commission, War Memorial Building, Nashville, Tenn., Dudley Tanner, chairman, has been authorized by State Board of Education to have plans drawn for hangar with repair and reconditioning shop at State School of Aeronautics, Sky Harbor, about 20 miles distant. Cost about $75,000 with equipment.

R. C. Teel, 427 Norton Avenue, Sylacauga, Ala., is planning operation of plant for manufacture of metallic caskets, and will purchase metal-forming and auxiliary equipment.

City Council, McComb, Miss., is considering installation of a municipal electric light and power plant.

SOUTH ATLANTIC

Diamond Service Co., Washington, has leased six buildings at First and M Streets, N. E., for new taxicab terminal, including machine works, oil storage and distributing facilities for bulk of 50,000 gal., and other equipment.

Constructing Quartermaster, Bolling Field, Washington, asks bids until Aug. 10 for underground high-tension power lines.

Annapolis & Chesapeake Bay Power Co., Annapolis, Md., will be offered at public sale in 60 to 90 days, following recent unsuccessful auction for electric light and power, and gas properties. Upset price of $2,294,800 has been placed on plants and system. Company has been in receivership for several months.

Economy Concrete Co., Petersburg Turnpike, Petersburg, Va., plans rebuilding part of plant recently destroyed by fire. Loss over $35,000 with equipment. J. S. Parrish is president.

James River Hydrate & Supply Co., Indian Rock, Va., L. P. Dillon, head, recently organized with capital of $200,000, has acquired limestone properties near Buchanan, Va., for new hydrate lime plant; initial works to cost over $35,000 with machinery.

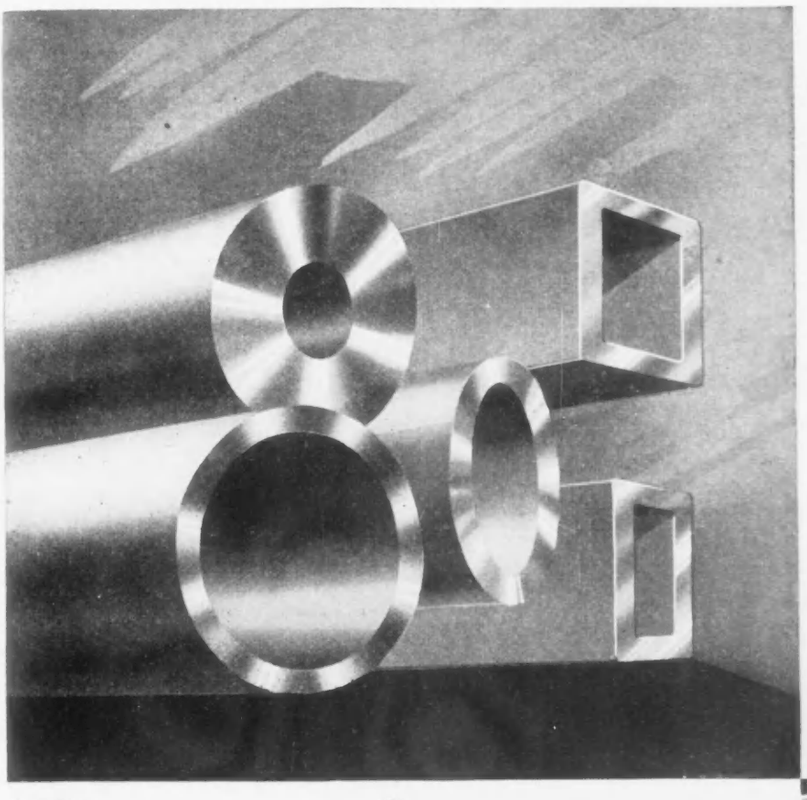
General Purchasing Officer, Panama Canal, Washington, asks bids until Aug. 11 for brass and steel machine bolts, carriage bolts, stove bolts, machine bolt nuts, steel rivets, plate washers, lock washers, finishing nails, metal safety treads, pintle bushings, chain hoists, wire rope, dump bodies and other equipment (Proposal 2777).

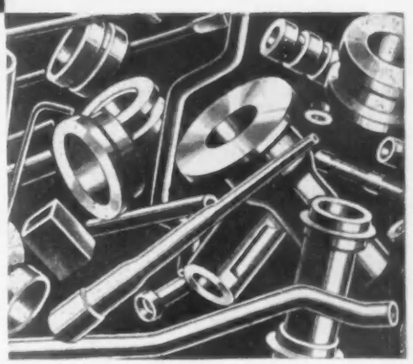
E. C. Otis Mfg. Co., Chester, W. Va., manufacturer of roofing materials, has resumed operations, following curtailment for several weeks.

Common Council, Jasper, Ga., plans installation of pumping machinery and auxiliary equipment for municipal waterworks. Bids will be asked this month. Cost about $25,000. J. B. McCrary & Co., Marietta Building, Atlanta, Ga., are engineers.

Fire Creek New River Coal Co., Claremont, W. Va., plans rebuilding tipple and head house at coal mining properties recently destroyed by fire. Loss about $40,000 with machinery.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Aug. 9 for brass pipe, brass and copper tubing (Schedule 8490); until Aug. 16, magnet wire (Schedule 8465), angle and globe valves and remote control stations (Schedule 8440), aluminum and aluminum alloy safety treads and





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US STEEL

NATIONAL-SHELBY SEAMLESS TUBING

ladder treads (Schedule 8425) for Eastern and Western navy yards; until Aug. 9 one crane truck, 3000-lb. capacity (Schedule 8453) for Sewall's Point, Va., Navy Yard, safety valves and spare parts (Schedule 8480) for Norfolk Navy Yard; until Aug. 16, one motor-driven precision bench lathe (Schedule 8449), two turbo-generator sets, two circuit breakers and spare parts, two ammeters, etc. (Schedule 8488) for New York or San Francisco navy yards; metallic ladder treads, aluminum (Schedule 8454) for Sewall's Point and Mare Island navy yards.

Pittsburgh Plate Glass Co., Grant Building, Pittsburgh, has leased three-story and basement building at Atlanta, Ga., for new factory branch, storage and distributing plant. C. E. Jee is company engineer.

Southern Fruit Distributors, Inc., Winter Garden, Fla., has approved plans for two-story addition to canning plant, part of unit to be equipped for mechanical and forge shop. C. W. Bowden is in charge of construction.

MIDDLE WEST

City Council, Geneva, Ill., asks bids until Aug. 22 for equipment for sewage treatment plant, including tanks, motor-driven pumping machinery, gas burner equipment, conveyors, etc. Cost about $120,000. Wells Engineering Co., Geneva, is engineer.

Hayes-Custer Stove & Furnace Co., Bloomington, Ill., has increased production schedule, reinstating about 200 men.

Ganschow Gear Co., 1013-15 West Washington Boulevard, Chicago, has been organized by C. F. and E. R. Goedke, and associates, to manufacture gears, gear reducers and kindred transmission specialties.

City Council, Hastings, Neb., A. T. Bratton, city clerk, is considering recommendations of Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., consulting engineer, for extensions and improvements in municipal electric light and power plants, to include installation of high pressure boiler, feeder, stoker and other steam power equipment, remodeling of 3500-kw. turbo-generator unit and installation of electrical equipment.

American Beet Sugar Co., Steel Building, Denver, is considering erection of new mill at Winnipeg, Man., with power house, machine shop and other mechanical departments. Cost over $750,000 with equipment.

Board of Education, Mount Pleasant, Iowa, is considering manual training department in new three-story high school, to replace unit recently destroyed by fire. Cost over $165,000. Keffer & Jones, Masonic Temple Building, Des Moines, Iowa, are architects.

United States Engineer Office, 333 North Michigan Avenue, Chicago, asks bids until Aug. 22 for new control house at Dresden Island lock, Illinois River (Circular 15).

Egyptian Tool Co., Inc., 104 South Gardner Street, West Frankfort, Ill., has been organized by C. L. Callahan and George I. Cotter, West Frankfort, to manufacture tools and other mechanical equipment.

Oxboro Flying Club, Lyndale Avenue South and Ninety-ninth Street, Minneapolis, Minn., plans rebuilding hangar at airport, with repair and reconditioning facilities, recently destroyed by fire.

City Council, Ralston, Neb., has plans for a municipal electric light and power house to cost over $75,000 with equipment. Bids for equipment will soon be asked. C. V. Barnhill, Federal Trust Building, Lincoln, Neb., is consulting engineer.

Village Council, Meadow Grove, Neb., F. J. Beech, village clerk, asks bids until Aug. 8 for motor-driven turbine-type deep well pumping equipment with accessories.

Universal Foundry Co., Oshkosh, Wis., has added equipment for producing brass and bronze commercial castings in addition to its gray iron, alloy iron and aluminum castings.

George-Watson Mfg. Co., Milwaukee, has been organized by George N. Sery and Watson F. Barnhart to develop line of mechanical devices they have jointly perfected. For the present, manufacturing will be done under contract with Milwaukee Valve Co., 2375 South Burrell Street, local.

Theodore Stark Construction Co., Cedar Rapids, Iowa, and Milwaukee, is low bidder at $51,860 for addition to municipal sewage treatment plant at Portage, Wis.

Immel Construction Co., 19 West Division Street, Fond du Lac, Wis., is low bidder at $28,711 for new sewage disposal plant.

SOUTHWEST

Wackman Welded Ware Co., 2412 South Seventh Street, St. Louis, manufacturer of steel barrels, drums and other welded products, has leased property at New Orleans, 18,000 sq. ft. floor space, formerly occupied by Stern Foundry Co., for new branch plant, primarily for production of steel barrels.

Looney's Sheet Metal Works, Inc., 314 South Kenosha Street, Tulsa, Okla., has been organized by Harold W. Looney and associates, to manufacture sheet metal products.

Pure Oil Co., 35 East Wacker Drive, Chicago, has authorized expansion and improvements at refinery at Muskogee, Okla., for gasoline production. Contract for certain equipment has been awarded to Alco Products, Inc., Dunkirk, N. Y. Cost over $100,000 with equipment.

Carl G. Stifel, president, John H. Gundlach & Co., 3600 North Broadway, St. Louis, is at head of project to build a hydroelectric power plant on Mississippi River in Madison and St. Charles counties, where it is planned to develop new industrial district. Plant will be equipped for initial capacity of 175,000 hp. Cost over $300,000 with transmission lines.

Tulsa Steel Co., Inc., Tulsa, Okla., recently organized by L. W. Conroy and associates, has taken over property at Sand Springs, Okla., formerly used for production of steel reinforcing bars, angle iron and kindred products, and will operate for same line of output. Mr. Conroy will be vice-president and general manager.

Henderson Tire & Rubber Co., Sand Springs Road, Tulsa, Okla., will install equipment for manufacture of automobile tires and tubes, to develop a capacity of about 2000 tires a day.

J. L. Crosthwait, County auditor, Dallas, Tex., asks bids until Aug. 8 for electrical equipment for County buildings.

W. H. Stovall, Breckenridge, Tex., and associates have plans for a new oil refinery near Mertzon, Tex. Cost over $80,000 with machinery.

Board of Public Works, Houston, Tex., plans extensions and improvements in municipal gas plant at Magnolia Park. Cost over $21,000 with equipment. J. M. Nagle is city engineer in charge.

American Airways, Inc., Fort Worth, Tex., a subsidiary of Aviation Corpn., 122 East Forty-second Street, New York, has revised plans for new two-story hangar at Fort Worth municipal airport, 160 x 236 ft., with repair and reconditioning departments. Cost over $90,000 with equipment. Jesse Maxwell is local representative.

Magnolia Petroleum Co., Fannin Street, Houston, Tex., has secured permission to install a carbon black manufacturing plant in Wheeler County. Initial plant will be equipped with compressors and auxiliary machinery to use about 4,000,000 cu. ft. residue gas from wells in that district.

PACIFIC COAST

Jones Chemical Co., Long Beach, Cal., a subsidiary of Dow Chemical Co., Midland, Mich., has awarded general contract to J. D. Sherer & Son, 1865 East Anaheim Street, for one-story plant, 56 x 130 ft., at 310 Santiago Avenue, installation to include steel tanks, pumping machinery, overhead trolley and other mechanical equipment. Engineering department of parent company, Midland, is engineer.

Bureau of Yards and Docks, Navy Department, Washington, asks bids until Aug. 10 for one 740,000-gal. capacity steel tank for Mare Island Navy Yard (Specification 6857).

Thomas Oughton, City Hall, Los Angeles, city purchasing agent, asks bids until Aug. 23 for one steam turbine electric generator unit, 81,250 kva. capacity, for installation at municipal electric light and power plant at Wilmington (Specification 2827); also one steam generating unit and auxiliary equipment for same plant (Specification 2826).

Pacific Fence Construction Co., 1223 North Highland Avenue, Los Angeles, iron fencing, has plans for one-story addition, 50 x 150 ft., for storage and distribution.

California Institute of Technology, Board of Trustees, 1201 East California Street, Pasadena, Cal., has awarded general contract to R. Westcott Co., 536 South Broadway, for two-story science building, 81 x 178 ft., to include machine rooms, grinding and polishing rooms, laboratory and other units for optical glass and precision work. An air-conditioning system will be installed. Cost about $175,000 with equipment.

Board of Public Works, Seattle, plans installation of two electric-operated pumping plants in connection with new trunk sewage system in Seward Park district. Entire project will cost about $150,000. O. A. Piper is assistant city engineer in charge.

Southern California Gas Co., 1700 Santa Fe Avenue, Los Angeles, has plans for one story mechanical shop, 110 x 295 ft. Part of unit will be used for service and repair of company motor trucks and cars. Cost about $75,000 with equipment.

Rosenberg Brothers, Cherry Street and Broadway, Fresno, Cal., has plan for new fruit dehydrating plant in Farmersville district, Exeter, Cal. Cost about $40,000 with machinery.

City Council, Beverly Hills, Cal., asks bids until Aug. 16 for pumping machinery and auxiliaries for municipal treatment plant No. 2, including a return water pump and booster pump. Salisbury, Bradshaw & Taylor, 714 West Tenth Street, Los Angeles, are consulting engineers.

FOREIGN

Ministry of Interior, Buenos Aires, Argentine Republic, is planning chain of large grain elevators in different parts of the country, with elevating, conveying, screening and other machinery. Total project to cost 150,000,000 pesos (about $88,500,000). Argentine Congress is now considering bill authorizing bond issue in that sum for project.

American Thermos Bottle Co., Norwich, Conn., is arranging for early manufacture of products at plant near London, England, heretofore used as an assembling division, and will convert works for complete production of metal and bottle containers for British market.

Off the Assembly Line

(Concluded from Page 191)

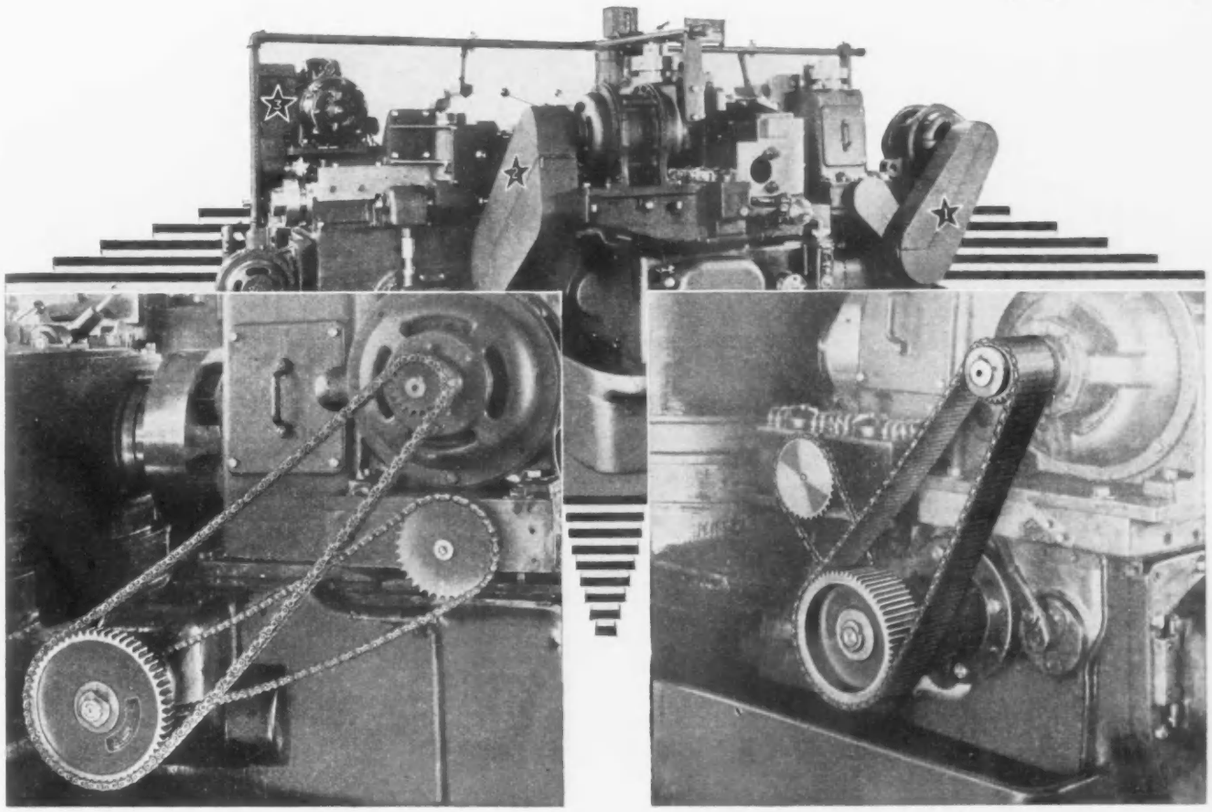
load capacities of 20,000 lb. for the 2-ton and 32,000 lb. for the 4-ton.

A new process for rust-proofing automobile bodies, by which each complete body assembly, instead of its separate panels, is treated just before the lacquer is applied, has been installed in the Graham body plant, and all bodies are now receiving the new protective treatment.

In the Parcoliting process used by Graham, the rust-proofing mixture is sprayed over the entire body, under a heavy pressure that insures its thoroughly covering the metal. Next, the body spends 20 min. passing through a drying oven heated to 225 deg. On emerging, the body is cleaned of the chalky residue, by means of power-operated brushes and compressed air blasts. Finally, an alcohol wipe completes the process. The primer coat for the color is applied immediately.

Henry Ford, in an interview with newspaper men on the occasion of his 69th birthday, said he expected a continued increase in the number of automobiles per capita in the United States. "Future business for the motor industry," said Mr. Ford, "does not depend on replacements alone. If you understand the American public, you will realize that they demand and will have more and better transportation facilities than at present. Automobile business will improve along with general conditions."

Ford Motor Co. recently started production in its new Ypsilanti, Mich., plant, where starting and generating equipment for the new V-8 is being made. The plant is operated by water power and will employ between 600 and 700 men.



Specify Chain Drives by Whitney

★

1. (Right) Whitney Silent Chain drives the main spindle from the 25 H.P., 1750 R.P.M. motor on the Goss & De Leeuw "Quad Matic." The spindle oiler is driven by Whitney Roller Chain.

★

2. (Above) The feed drive from the 7½ H.P. 1150 R.P.M. motor and the feed drive oiler on the automatic chucking machine are driven respectively by Whitney Silent and Roller Chain.

★

3. The speeder drive transmitting 5 H.P. at 110 R.P.M. on the Quad Radial utilizes Whitney Roller Chain.

Sales and Engineering Offices

BOSTON	10 Mt. Auburn Street
CHICAGO	549 W. Wash. Blvd.
CLEVELAND	1213 W. Third Street
DETROIT	2-240 Gen. Motors Bldg.
NEW YORK	250 W. 54th Street
PHILADELPHIA	133 S. 36th Street
SAN FRANCISCO	1142 Howard St.
SYRACUSE	201 Norwood Avenue

Agents in Principal Cities

Production machines built to maintain a production schedule can tolerate only the most efficient type of power transmission medium. They must have positive action, overload capacity and the ability to stand up under continuous operating conditions.

WHITNEY Silent and Roller Chain Drives were specified on the Goss & De Leeuw "Quad Matic" Automatic Chucking Machine, because they met these production requirements. In addition, they allowed greater flexibility of design due to the fact that small driving pinions and short centers can be used without shortening the life of the drive.

WHITNEY, as manufacturer of both Silent and Roller Chain, is in a position to specify the right type of drive for your particular application. WHITNEY Engineers will gladly work with you on your drive problem without obligation. Write for catalogs, V-100 (Silent Chain), V-95 (Roller Chain).

THE WHITNEY MFG. CO. Hartford, Conn.

WHITNEY SILENT AND ROLLER CHAIN DRIVES

FOR POSITIVE POWER TRANSMISSION

Cost of Pipe and Segregation in Ingots

(Concluded from Page 184)

sary top and bottom discards for squaring the ends.

The 16 per cent difference between the average and the maximum yield is probably 14 per cent pipe and 2 per cent surface and miscellaneous defects.

Segregation, which is the term for that variation in the chemical composition of a steel ingot caused by selective and progressive solidification, occurs at its maximum in the last metal of the ingot to have been fluid. It is, therefore, closely related to the lower portion of the pipe cavity and means for controlling the latter are also means for controlling segregation.

There is sufficient information available today to save as much as 70 per cent of the cost brought about by piping and segregation, without causing operating hardships, involving complicated processes, or without the necessity of revamping existing equipment. There would probably soon be marked improvement over this figure, and over present conceptions, if a small fraction of the research and effort were applied to it that is now applied to those things which are aggravating the situation.

The phenomenon of piping has always been present since steel has been cast in the liquid form. During the reign of the Bessemer process and in the early stages of the open-hearth period, piped blooms were rolled into finished products without serious consequences. Modern requirements do not permit this, and demands for sounder steel are continually becoming more exacting.

Why Discarding Has Been Allowed to Increase

To discard the unsound portion of ingots and remelt is an accepted practice that has gradually grown in consequences from negligible proportions in the beginning to the present largest single item of production cost, outside of materials. That it could attain this significance is not remarkable.

Isolated attempts for compensating for pipe have been undertaken many times, but usually for a special and not a general condition. Some methods require special equipment or special handling, or both, not adaptable to modern tonnage plant procedure. Still other processes, satisfactory with small ingots, and adaptable to tonnage plants, are inadequate for the larger sizes of ingot. Probably the greatest factor in allowing this increment of cost to grow slowly to its present proportion is that no generally adopted cost sheet clearly shows it.

The causes of both piping and segregation are common knowledge among steel makers—that is, those causes which it would be essential to know if they are to be remedied. Nothing of an exceedingly technical nature is involved. The greatest problem is to select that process or processes which can be modified and systematized so that it will fit into our present plants without hindering production or demoralizing existing procedure.

It could not be expected that any of the existing tried processes could immediately be arranged to produce the calculated correct yield, but 90 per cent could be an expected figure. More than this, the present tendency toward increased discard, if carried to its limit, would no longer be a cause for alarm.

Alloy Cast Iron Developed For Machine Tool Parts

(Concluded from Page 183)

physical properties of this alloy iron as cast and after heat treatment. As cast, this iron has a tensile strength of 50,000 to 55,000 lb. per sq. in. with a transverse strength of 5000 to 5500 lb. per sq. in. The Brinell hardness of the cast metal is 212 to 240.

Special Heat Treatment Gives High Strength

In order to raise the tensile strength and hardness of this material for certain requirements, it is subjected to heat treatment, the following practice being typical: The castings are heated to 1550 to 1600 deg. F. and then quenched. Tempering is then done at 850 to 950 deg. F. to give a Brinell hardness of 286 to 340. Selection of the quenching medium is governed by the size of the section being heat treated; heavy sections are quenched in water, while lighter ones are usually quenched in oil.

The average tensile strength of the heat-treated iron is 70,000 to 75,000 lb. per sq. in. according to the company's tests. Results of a typical test of one of the heats poured are as follows:

Tensile strength as cast, lb. per sq. in.: 57,380; 59,280; and 57,800
Transverse strength as cast, lb. per sq. in.: 5,050; 5,110; 5,330; 5,190; 5,160
Tensile strength, heat-treated, lb. per sq. in.: 79,740; 78,840; 84,580
Brinell hardness, as cast—240
Brinell hardness, heat-treated—321

Chemical analysis:	Per Cent
Combined carbon	0.50
Graphitic carbon	2.25
Silicon	2.41
Sulphur	0.027
Phosphorus	0.031
Nickel	1.80
Chromium	0.42

A feature of this iron is its machineability at a Brinell hardness of 340 with a fine machine finish and mirror-like polish. Its uniformity of structure also tends to easy maintenance of predetermined accuracy of machining dimensions. The structure of this material is shown by three photomicrographs.

The development of such an alloy cast iron is a demonstration of the modern possibilities of metallurgy and modern foundry practice. By suitable alloying and heat treatment, it is possible to obtain a material which has not only high strength and hardness combined with machineability, but also splendid resistance to wear. It has proved to be the correct material for the application referred to in the Mult-Au-Matic machines and superior to plain carbon and some alloy steels formerly incorporated in these parts. Its qualities are such that it is likely that many other applications for it in industry will spring up.

Storage of Rubber Belts During Shut-Downs

Useful data relating to the protection of rubber belting from deterioration during plant shut-downs of more or less indefinite duration are contained in a bulletin published recently by the B. F. Goodrich Co., Akron, Ohio.

"Belts should be stored in a dark, cool (not over 70 deg. F.) place which is maintained under humidity conditions which are not too dry," states the bulletin. "This does not mean belts should be stored with one end standing wet, but the air of the warehouse should not be too dry. Direct sunlight and warm air should be avoided.

"To further protect belting in storage the following preparation may be used to treat the edges and exposed face of belt in roll form: 1 qt. shellac, 1 pt. alcohol, 1½ qt. household ammonia, and 3 qt. water.

"This solution can be quickly applied with a whitewash brush. One gallon should cover 300 sq. ft. It can be purchased already mixed, combined with special age-resisting chemicals."

Where the shut-down period is expected to be too short to warrant taking off the belts and rolling them up, it is suggested that the installation be checked to make certain that all belt tension has been removed.

Texas Joint Co. has arranged with Poole & McGonigle, fabricators and manufacturers at Portland, Ore., for the latter to serve as manufacturers and distributers in the Pacific Northwest under a license. It is planned to start manufacturing and reclaiming steel rail joints this fall, with a daily production of 50 tons of spikes and bolts.

WAREHOUSE SERVICE . . . .

THAT CUTS THE CLOTH TO FIT THE PATTERN

AN evidence of the lengths to which the J & L Warehouse service ideal is carried is found in the Oxygraph Torch installed at the Chicago Warehouse. Circles, rings, plates of irregular design and of all thicknesses up to and including 6 inches, heavy parts which ordinarily would be cast or forged and thus would require considerable time in the making—all such items may be produced on the Oxygraph with ease and precision.

The J & L Warehouse organization never relaxes from its determination to give you just the steel you want, when—where—and as you want it. Its service cuts the cloth to fit the pattern; its stocks are planned to meet local needs, to fill your individual requirements.

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LOUISVILLE—Magnolia 1693 . . . Stock of Bars for Concrete Reinforcement and Bar Fabricating Yard
MEMPHIS—6-4836 . . . Distributing Warehouse for Pipe, Sheets, Spikes and Wire Products. Reinforcing Bar Warehouse and Fabricating Shop

Wisconsin Plans to Establish Unemployment Reserves

(Concluded from Page 179)

Fund," created for this purpose by each of the parties to the agreement.

Cash unemployment payments accruing to an employee for whom no employment can be found shall be computed at the rate of 65 per cent of the average wage scale paid such employee during the year preceding the beginning of unemployment. Cash unemployment payments shall be made on the usual pay day but no payment shall be made for the first 15 days of unemployment. Payments shall discontinue from the time the employee shall be offered employment from one of the three companies, or when he enters into an occupation or engages in business for himself or others, or when he has been employed elsewhere, or when he declines some other wage-earning employment.

Employees temporarily or permanently laid off are not guaranteed the same work or the same amount of wages they formerly received. Efforts will be made, however, to furnish employment as good or better whenever possible. Benefits will not accrue to employees who quit work for any reason or who are discharged by the employing company for cause. No benefits will accrue to the employee during any period when he is receiving benefits from the Workmen's Compensation Act. The plan also provides that the State Industrial Commission shall act as referee in any matter of dispute between the employee and employer and its decision shall be final. Each company to the agreement reserves the right to withdraw from the plan at the end of any year of operation of the plan if it experiences that the plan does not operate in the interests of steady and permanent employment, or when it conflicts with the State or Federal laws regulating the employment or unemployment of labor.

Wisconsin Association Against Insurance by Law

A SPECIAL committee on unemployment insurance of the Wisconsin Manufacturers' Association stands unalterably opposed to what is commonly known as unemployment insurance by law. It takes the stand that unemployment is not an insurable risk for which reason it prefers to call its proposed plan a "voluntary savings and benefit fund."

This committee has reached agreement that all manual and clerical workers under a specified maximum wage classification in industry should be included and that the fund should be created jointly by workers and employers, preferably in equal amounts. Industry itself should administer the fund through a joint board representing employees and employers, with probably a chairman chosen by representatives of both. A system of employment agencies operated by industry would be set up and fund benefits would be paid only to those who had been employed by the company or group for a specified time during the previous year.

An applicant for benefit should be denied if he has been unreasonable in his refusal to accept employment. Benefits should not be paid to a man out on strike but refusal to accept a job as a strike-breaker should not be considered unreasonable.

Rate of benefit should depend on the individual wage rate with a proportionately higher ratio for the lower paid employees. It is also suggested that length of service be recognized by increased benefits.

There should be a waiting period before eligible employees can receive benefits which should be paid weekly. An employee would become ineligible if he quits or is discharged for cause.

The committee takes the stand that a committee of employees alone should be set up to pass on whether a discharge was for or without cause, and as to whether refusal to work was unreasonable. The committee does not make specific recommendations as to the nature of the fund.

Hydraulic Grinders Employed in Making Buick Gears

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department, the inspector who examines it immediately after the grinding operations etches on it an identification mark consisting of four numbers. The first number represents the section of the department in which the grinding work was done, the second the number of the machine in the section on which the teeth were ground, the third the clock number of the operator and the fourth the inspector.

To simplify control of production in the department, the 32 gear grinding machines are arranged so that the floor space they occupy is divided into four equal sections consisting of two rows of four machines each. Individual machines are numbered from one to eight in the same consecutive order in each section. That is, No. 3 machine in section 1 is in the same position relative to the other machines in its section as No. 3 machine in section 2. One operator handles two machines, so that the entire battery of grinding machines is manned by 16 operators.

Formerly it was the practice to perform sub-assemblies along the main transmission assembly line. However, this has been abandoned in favor of doing all sub-assembly work in the manufacturing departments and sending the completed parts to the final line. This change has effected a substantial saving in labor, has cut down the trucking of parts and has centralized responsibility, thereby contributing to increased efficiency. Twenty-four men now assemble 450 transmissions in a 9-hr. day.

Plastic Molding of Phenolic Resins

(Concluded from Page 175)

moval from the press. Automatic presses permit operation of the mold without its removal from the press, as the movement of the press ejects the finished parts. Some presses are in use which have two sets of rams, one set operating vertically and one set horizontally, thereby furnishing direct pressure on all sides of the mold.

The two classes of molds are hand and semi-automatic and these types may be classed as either overflow, positive or semi-positive.

Overflow molds consist of an upper and lower half with central cavities the exact depth of the piece required. They are charged or filled with sufficient molding material to insure a flash or overflow to assure the mold cavity being entirely filled after compression.

Positive type molds are made with the cavities sufficiently deep to take a full charge of material, and the plunger, which telescopes within the cavity and compresses the molding material, forces it into the entire mold. In this type allowance has to be made in the size of the cavity to allow for compression of about 2½ times the volume of the finished piece. There is practically no loss of material in this mold. The semi-positive mold differs from the positive type in that the plunger telescopes into the body of the mold sufficiently to give positive pressure at the final closing of the mold. Any of these types of molds may have single or multiple cavities, and they may be split vertically to take care of undercuts in the molded piece.

The Federal Trade Commission has announced that an open meeting of all fabricators of ornamental iron, bronze and wire products, including light structural steel, will be held at the Hotel Riverside, Cambridge Springs, Pa., Oct. 3, for the discussion of trade practices and the adoption of rules for the industry's guidance in the future.